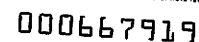
 EPA-OTS

90-890000597

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Comprehensive Assessment Information Rule
REPORTING FORM

When completed, send this form to:

Document Processing Center
Office of Toxic Substances, TS-790
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460
Attention: CAIR Reporting Office

For Agency Use Only:

Date of Receipt: _____

Document
Control Number:

Docket Number:

SECTION 1 GENERAL MANUFACTURER, IMPORTER, AND PROCESSOR INFORMATION

PART A GENERAL REPORTING INFORMATION

1.01 This Comprehensive Assessment Information Rule (CAIR) Reporting Form has been completed in response to the Federal Register Notice of..... [1][2][2][2][8][8]
CBI mo. day year

[] a. If a Chemical Abstracts Service Number (CAS No.) is provided in the Federal Register, list the CAS No. [0][2][6][4][7][1]-[6][2]-[5]

b. If a chemical substance CAS No. is not provided in the Federal Register, list either (i) the chemical name, (ii) the mixture name, or (iii) the trade name of the chemical substance as provided in the Federal Register.

(i) Chemical name as listed in the rule NA

(ii) Name of mixture as listed in the rule Toluene Diisocyanate

(iii) Trade name as listed in the rule

c. If a chemical category is provided in the Federal Register, report the name of the category as listed in the rule, the chemical substance CAS No. you are reporting on which falls under the listed category, and the chemical name of the substance you are reporting on which falls under the listed category.

Name of category as listed in the rule NA

CAS No. of chemical substance [][][][][][]-[][]-[][]

Name of chemical substance

1.02 Identify your reporting status under CAIR by circling the appropriate response(s).

CBI Manufacturer 1

[] Importer 2

Processor ③

X/P manufacturer reporting for customer who is a processor 4

X/P processor reporting for customer who is a processor 5

[] Mark (X) this box if you attach a continuation sheet.

1.03 Does the substance you are reporting on have an "x/p" designation associated with it in the above-listed Federal Register Notice?

CBI
☐ Yes [☒] Go to question 1.04
☐ No [☐] Go to question 1.05

1.04 a. Do you manufacture, import, or process the listed substance and distribute it under a trade name(s) different than that listed in the Federal Register Notice? Circle the appropriate response.

CBI
☐ Yes 1
☐ No (2)

b. Check the appropriate box below:

☐ You have chosen to notify your customers of their reporting obligations

Provide the trade name(s)

☐ You have chosen to report for your customers

☐ You have submitted the trade name(s) to EPA one day after the effective date of the rule in the Federal Register Notice under which you are reporting.

1.05 If you buy a trade name product and are reporting because you were notified of your reporting requirements by your trade name supplier, provide that trade name.

CBI
☐ Trade name BAYTHERM U933A (MONDUR 437)
☐ DOW VORONATE (R) 3138 SPECIALTY ISOCYANATE
Is the trade name product a mixture? Circle the appropriate response.
Yes 1
No (2)

1.06 Certification -- The person who is responsible for the completion of this form must sign the certification statement below:

CBI
☐ "I hereby certify that, to the best of my knowledge and belief, all information entered on this form is complete and accurate."

Bob Osborne
NAME

Bob Osborne
SIGNATURE

8/9/89
DATE SIGNED

V.P. Engman, Jr. Div
TITLE

(615) 928-6411
TELEPHONE NO.

☐ Mark (X) this box if you attach a continuation sheet.

PART B CORPORATE DATA

1.09 Facility Identification

CBI Name [M][O][R]-[F][L][O]-[I][N][D][U][S][T][R][I][E][S]-[I][N][C.]-[]-[]-[]-[]

[] Address [O][A][K][L][A][N][D]&[E][A][S][T]-[F][A][I][R][V][I][E][W]-[A][V][E.]-[]
Street

[J][O][H][N][S][O][N]-[C][I][T][Y]-[]-[]-[]-[]-[]-[]-[]-[]-[]-[]-[]
City

[T][N.]-[]-[]-[]-[]-[]-[]-[]-[]-[]-[]-[]
State Zip

Dun & Bradstreet Number[0][0]-[4][4][6]-[0][5][1][5]

EPA ID NumberTND..[0][4][1][1][5][0][4][7][5]

Employer ID Number[3][4][2][2][9][9][6][0] 0

Primary Standard Industrial Classification (SIC) Code[3][6][3][9]

Other SIC Code[]-[]-[]-[]

Other SIC Code[]-[]-[]-[]

1.10 Company Headquarters Identification

CBI Name [M][O][R]-[F][L][O]-[I][N][D][U][S][T][R][I][E][S]-[I][N][C.]-[]-[]-[]-[]

[] Address [1][8][4][5][0]-[S][O][U][T][H]-[M][I][L][E][S]-[R][O][A][D]-[]-[]-[]
Street

[C][L][E][V][E][L][A][N][D]-[]-[]-[]-[]-[]-[]-[]-[]-[]-[]-[]
City

[O][H.]-[]-[]-[]-[]-[]-[]-[]-[]-[]-[]-[]
State Zip

Dun & Bradstreet Number[0][0]-[4][4][6]-[0][5][1][5]

Employer ID Number[3][4][2][2][9][9][6][0] 0

[] Mark (X) this box if you attach a continuation sheet.

1.11 Parent Company Identification

[illegible]

1.12 Technical Contact

CBI Name [J][O][H][N]_[_]M_c[C][L][A][I][N]_[_]_[_]_[_]_[_]_[_]_[_]_[_]_[_]
[] Title [S][A][F][E][T][Y]_[_]A_N_D_[_]S[E][C][U][R][I][T][Y]_[_]D[I][R][E][C][T] O R
Address [O][A][K][L][A][N][D]_[_]&_[_]E[A][S][T]_[_]F[A][I][R][V][I][E][W]_[_]
 Street

 [J][O][H][N][S][O][N]_[_]C[I][T][Y]_[_]_[_]_[_]_[_]_[_]_[_]_[_]_[_]
 City

 [T][N] [3][7][6][0][5]--[][][][]
 State Zip

Telephone Number[6][1][5]-[9][2][8]-[6][4][1][1]

1.13 This reporting year is from $\begin{bmatrix} 0 \\ \text{Mo.} \end{bmatrix} \begin{bmatrix} 1 \\ \text{Year} \end{bmatrix}$ to $\begin{bmatrix} 1 \\ \text{Mo.} \end{bmatrix} \begin{bmatrix} 2 \\ \text{Year} \end{bmatrix}$ $\begin{bmatrix} 8 \\ \text{Mo.} \end{bmatrix} \begin{bmatrix} 8 \\ \text{Year} \end{bmatrix}$

☐ Mark (X) this box if you attach a continuation sheet.

1.16 For each classification listed below, state the quantity of the listed substance that was manufactured, imported, or processed at your facility during the reporting year.

CBI

☐

Classification

Quantity (kg/yr)

Manufactured 0

Imported 0

Processed (include quantity repackaged) 470,000 kg

Of that quantity manufactured or imported, report that quantity:

In storage at the beginning of the reporting year NA

For on-site use or processing NA

For direct commercial distribution (including export) NA

In storage at the end of the reporting year NA

Of that quantity processed, report that quantity:

In storage at the beginning of the reporting year 35,000 kg

Processed as a reactant (chemical producer) 470,000 kg

Processed as a formulation component (mixture producer) NA

Processed as an article component (article producer) NA

Repackaged (including export) NA

In storage at the end of the reporting year 29,000 kg

☐ Mark (X) this box if you attach a continuation sheet.

2.04 State the quantity of the listed substance that your facility manufactured, imported, or processed during the 3 corporate fiscal years preceding the reporting year in descending order.

CBI

☐ Year ending [1][2] [8][7]
Mo. Year

Quantity manufactured 0 kg

Quantity imported 0 kg

Quantity processed 403,000 kg

Year ending [1][2] [8][6]
Mo. Year

Quantity manufactured 0 kg

Quantity imported 0 kg

Quantity processed 424,000 kg

Year ending [1][2] [8][5]
Mo. Year

Quantity manufactured kg

Quantity imported kg

Quantity processed UK kg

2.05 Specify the manner in which you manufactured the listed substance. Circle all appropriate process types.

CBI

☐ Continuous process 1
Semicontinuous process 2
Batch process 3

☐ Mark (X) this box if you attach a continuation sheet.

2.06 Specify the manner in which you processed the listed substance. Circle all appropriate process types.

- ☐ Continuous process 1
- ☐ Semicontinuous process ②
- ☐ Batch process 3

2.07 State your facility's name-plate capacity for manufacturing or processing the listed substance. (If you are a batch manufacturer or batch processor, do not answer this question.)

- ☐ Manufacturing capacity kg/yr
- ☐ Processing capacity UK kg/yr

2.08 If you intend to increase or decrease the quantity of the listed substance manufactured, imported, or processed at any time after your current corporate fiscal year, estimate the increase or decrease based upon the reporting year's production volume.

<input type="checkbox"/>	Manufacturing Quantity (kg)	Importing Quantity (kg)	Processing Quantity (kg)
Amount of increase			470,000 kg
Amount of decrease			

☐ Mark (X) this box if you attach a continuation sheet.

2.09 For the three largest volume manufacturing or processing process types involving the listed substance, specify the number of days you manufactured or processed the listed substance during the reporting year. Also specify the average number of hours per day each process type was operated. (If only one or two operations are involved, list those.)

CBI

☐

	<u>Days/Year</u>	<u>Average Hours/Day</u>
--	------------------	------------------------------

Process Type #1 (The process type involving the largest quantity of the listed substance.)

Manufactured	_____	_____
Processed	<u>256</u>	<u>6</u>

Process Type #2 (The process type involving the 2nd largest quantity of the listed substance.)

Manufactured	_____	_____
Processed	_____	_____

Process Type #3 (The process type involving the 3rd largest quantity of the listed substance.)

Manufactured	_____	_____
Processed	_____	_____

2.10 State the maximum daily inventory and average monthly inventory of the listed substance that was stored on-site during the reporting year in the form of a bulk chemical.

CBI

☐

Maximum daily inventory	<u>55,000</u>	kg
Average monthly inventory	<u>35,000</u>	kg

☐ Mark (X) this box if you attach a continuation sheet.

2.11 Related Product Types -- List any byproducts, coproducts, or impurities present with the listed substance in concentrations greater than 0.1 percent as it is manufactured, imported, or processed. The source of byproducts, coproducts, or impurities means the source from which the byproducts, coproducts, or impurities are made or introduced into the product (e.g., carryover from raw material, reaction product, etc.).

CBI

☐

<u>CAS No.</u>	<u>Chemical Name</u>	<u>Byproduct, Coproduct or Impurity¹</u>	<u>Concentration (%) (specify ± % precision)</u>	<u>Source of By-products, Coproducts, or Impurities</u>
	NA			

¹Use the following codes to designate byproduct, coproduct, or impurity:

B = Byproduct
C = Coproduct
I = Impurity

☐ Mark (X) this box if you attach a continuation sheet.

- 2.12 Existing Product Types -- List all existing product types which you manufactured, imported, or processed using the listed substance during the reporting year. List the quantity of listed substance you use for each product type as a percentage of the total volume of listed substance used during the reporting year. Also list the quantity of listed substance used captively on-site as a percentage of the value listed under column b., and the types of end-users for each product type. (Refer to the instructions for further explanation and an example.)

CBI

☐

a.	b.	c.	d.
Product Types ¹	% of Quantity Manufactured, Imported, or Processed	% of Quantity Used Captively On-Site	Type of End-Users ²
B	100%	0%	CS

¹Use the following codes to designate product types:

A = Solvent	L = Moldable/Castable/Rubber and additives
B = Synthetic reactant	M = Plasticizer
C = Catalyst/Initiator/Accelerator/ Sensitizer	N = Dye/Pigment/Colorant/Ink and additives
D = Inhibitor/Stabilizer/Scavenger/ Antioxidant	O = Photographic/Reprographic chemical and additives
E = Analytical reagent	P = Electrodeposition/Plating chemicals
F = Chelator/Coagulant/Sequestrant	Q = Fuel and fuel additives
G = Cleanser/Detergent/Degreaser	R = Explosive chemicals and additives
H = Lubricant/Friction modifier/Antiwear agent	S = Fragrance/Flavor chemicals
I = Surfactant/Emulsifier	T = Pollution control chemicals
J = Flame retardant	U = Functional fluids and additives
K = Coating/Binder/Adhesive and additives	V = Metal alloy and additives
	W = Rheological modifier
	X = Other (specify) _____

²Use the following codes to designate the type of end-users:

I = Industrial	CS = Consumer
CM = Commercial	H = Other (specify) _____

☐ Mark (X) this box if you attach a continuation sheet.

- 2.13 Expected Product Types -- Identify all product types which you expect to manufacture, import, or process using the listed substance at any time after your current corporate fiscal year. For each use, specify the quantity you expect to manufacture, import, or process for each use as a percentage of the total volume of listed substance used during the reporting year. Also list the quantity of listed substance used captively on-site as a percentage of the value listed under column b., and the types of end-users for each product type. (Refer to the instructions for further explanation and an example.)

CBI

☐

a.	b.	c.	d.
Product Types ¹	% of Quantity Manufactured, Imported, or Processed	% of Quantity Used Captively On-Site	Type of End-Users ²
B	100%	0%	CS

¹Use the following codes to designate product types:

A = Solvent	L = Moldable/Castable/Rubber and additives
B = Synthetic reactant	M = Plasticizer
C = Catalyst/Initiator/Accelerator/ Sensitizer	N = Dye/Pigment/Colorant/Ink and additives
D = Inhibitor/Stabilizer/Scavenger/ Antioxidant	O = Photographic/Reprographic chemical and additives
E = Analytical reagent	P = Electrodeposition/Plating chemicals
F = Chelator/Coagulant/Sequestrant	Q = Fuel and fuel additives
G = Cleanser/Detergent/Degreaser	R = Explosive chemicals and additives
H = Lubricant/Friction modifier/Antiwear agent	S = Fragrance/Flavor chemicals
I = Surfactant/Emulsifier	T = Pollution control chemicals
J = Flame retardant	U = Functional fluids and additives
K = Coating/Binder/Adhesive and additives	V = Metal alloy and additives
	W = Rheological modifier
	X = Other (specify) _____

²Use the following codes to designate the type of end-users:

I = Industrial	CS = Consumer
CM = Commercial	H = Other (specify) _____

☐ Mark (X) this box if you attach a continuation sheet.

2.14 Final Product -- Complete the following table for each type of final product manufactured, imported, or processed at your facility that contains the listed substance other than as an impurity.

☐

a.	b.	c.	d.
Product Type ¹	Final Product's Physical Form ²	Average % Composition of Listed Substance in Final Product	Type of End-Users ³
NA			

¹Use the following codes to designate product types:

A = Solvent	L = Moldable/Castable/Rubber and additives
B = Synthetic reactant	M = Plasticizer
C = Catalyst/Initiator/Accelerator/Sensitizer	N = Dye/Pigment/Colorant/Ink and additives
D = Inhibitor/Stabilizer/Scavenger/Antioxidant	O = Photographic/Reprographic chemical and additives
E = Analytical reagent	P = Electrodeposition/Plating chemicals
F = Chelator/Coagulant/Sequestrant	Q = Fuel and fuel additives
G = Cleanser/Detergent/Degreaser	R = Explosive chemicals and additives
H = Lubricant/Friction modifier/Antiwear agent	S = Fragrance/Flavor chemicals
I = Surfactant/Emulsifier	T = Pollution control chemicals
J = Flame retardant	U = Functional fluids and additives
K = Coating/Binder/Adhesive and additives	V = Metal alloy and additives
	W = Rheological modifier
	X = Other (specify) _____

²Use the following codes to designate the final product's physical form:

A = Gas	F2 = Crystalline solid
B = Liquid	F3 = Granules
C = Aqueous solution	F4 = Other solid
D = Paste	G = Gel
E = Slurry	H = Other (specify) _____
F1 = Powder	

³Use the following codes to designate the type of end-users:

I = Industrial	CS = Consumer
CM = Commercial	H = Other (specify) _____

☐ Mark (X) this box if you attach a continuation sheet.

SECTION 3 PROCESSOR RAW MATERIAL IDENTIFICATION

PART A GENERAL DATA

- 3.01 Specify the quantity purchased and the average price paid for the listed substance for each major source of supply listed. Product trades are treated as purchases.
CBI The average price is the market value of the product that was traded for the listed substance.

☐

<u>Source of Supply</u>	<u>Quantity (kg)</u>	<u>Average Price (\$/kg)</u>
The listed substance was manufactured on-site.	<u>NA</u>	<u>NA</u>
The listed substance was transferred from a different company site.	<u>NA</u>	<u>NA</u>
The listed substance was purchased directly from a manufacturer or importer.	<u>470,000 kg</u>	<u>\$1.93</u>
The listed substance was purchased from a distributor or repackager.	<u>NA</u>	<u>NA</u>
The listed substance was purchased from a mixture producer.	<u>NA</u>	<u>NA</u>

- 3.02 Circle all applicable modes of transportation used to deliver the listed substance to your facility.

CBI

☐

- Truck ①
Railcar 2
Barge, Vessel 3
Pipeline 4
Plane 5
Other (specify) _____ 6

☐ Mark (X) this box if you attach a continuation sheet.

3.03 a. Circle all applicable containers used to transport the listed substance to your facility.

☐

Bags 1
Boxes 2
Free standing tank cylinders 3
Tank rail cars 4
Hopper cars 5
Tank trucks ⑥
Hopper trucks 7
Drums 8
Pipeline 9
Other (specify) _____ 10

b. If the listed substance is transported in pressurized tank cylinders, tank rail cars, or tank trucks, state the pressure of the tanks.

Tank cylinders NA mmHg
Tank rail cars NA mmHg
Tank trucks 250-500 mmHg

☐ Mark (X) this box if you attach a continuation sheet.

PART C RAW MATERIAL VOLUME

3.05 State the quantity of the listed substance used as a raw material during the reporting year in the form of a class I chemical, class II chemical, or polymer, and the percent composition, by weight, of the listed substance.

☐

	Quantity Used (kg/yr)	% Composition by Weight of Listed Sub- stance in Raw Material (specify \pm % precision)
Class I chemical	470,000 kg	70% \pm 5%
Class II chemical		
Polymer		

☐ Mark (X) this box if you attach a continuation sheet.

SECTION 4 PHYSICAL/CHEMICAL PROPERTIES

General Instructions:

If you are reporting on a mixture as defined in the glossary, reply to questions in Section 4 that are inappropriate to mixtures by stating "NA -- mixture."

For questions 4.06-4.15, if you possess any hazard warning statement, label, MSDS, or other notice that addresses the information requested, you may submit a copy or reasonable facsimile in lieu of answering those questions which it addresses.

PART A PHYSICAL/CHEMICAL DATA SUMMARY

- 4.01 Specify the percent purity for the three major¹ technical grade(s) of the listed substance as it is manufactured, imported, or processed. Measure the purity of the substance in the final product form for manufacturing activities, at the time you import the substance, or at the point you begin to process the substance.

CBI

☐

	<u>Manufacture</u>	<u>Import</u>	<u>Process</u>
Technical grade #1	_____ % purity	_____ % purity	<u>65-75</u> % purity
Technical grade #2	_____ % purity	_____ % purity	<u>>50</u> % purity
Technical grade #3	_____ % purity	_____ % purity	_____ % purity

¹Major = Greatest quantity of listed substance manufactured, imported or processed.

- 4.02 Submit your most recently updated Material Safety Data Sheet (MSDS) for the listed substance, and for every formulation containing the listed substance. If you possess an MSDS that you developed and an MSDS developed by a different source, submit your version. Indicate whether at least one MSDS has been submitted by circling the appropriate response.

Yes ①

No 2

Indicate whether the MSDS was developed by your company or by a different source.

Your company 1

Another source ②

☒ Mark (X) this box if you attach a continuation sheet.

4.03 Submit a copy or reasonable facsimile of any hazard information (other than an MSDS) that is provided to your customers/users regarding the listed substance or any formulation containing the listed substance. Indicate whether this information has been submitted by circling the appropriate response.

Yes 1

No ②

4.04 For each activity that uses the listed substance, circle all the applicable number(s) corresponding to each physical state of the listed substance during the activity listed. Physical states for importing and processing activities are determined at the time you import or begin to process the listed substance. Physical states for manufacturing, storage, disposal and transport activities are determined using the final state of the product.

CBI

☐

Activity	Physical State				
	Solid	Slurry	Liquid	Liquified Gas	Gas
Manufacture	1	2	3	4	5
Import	1	2	3	4	5
Process	1	2	③	4	5
Store	1	2	③	4	5
Dispose	1	2	3	4	5
Transport	1	2	3	4	5

☐ Mark (X) this box if you attach a continuation sheet.

4.05 Particle Size -- If the listed substance exists in particulate form during any of the following activities, indicate for each applicable physical state the size and the percentage distribution of the listed substance by activity. Do not include particles ≥ 10 microns in diameter. Measure the physical state and particle sizes for importing and processing activities at the time you import or begin to process the listed substance. Measure the physical state and particle sizes for manufacturing storage, disposal and transport activities using the final state of the product.

CBI

☐

<u>Physical State</u>		<u>Manufacture</u>	<u>Import</u>	<u>Process</u>	<u>Store</u>	<u>Dispose</u>	<u>Transport</u>
Dust	<1 micron	<u>NA</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
	1 to <5 microns	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
	5 to <10 microns	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Powder	<1 micron	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
	1 to <5 microns	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
	5 to <10 microns	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Fiber	<1 micron	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
	1 to <5 microns	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
	5 to <10 microns	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Aerosol	<1 micron	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
	1 to <5 microns	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
	5 to <10 microns	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>

☐ Mark (X) this box if you attach a continuation sheet.

SECTION 5 ENVIRONMENTAL FATE

PART A RATE CONSTANTS AND TRANSFORMATION PRODUCTS

5.01 Indicate the rate constants for the following transformation processes.

a. Photolysis:

Absorption spectrum coefficient (peak) 871 (1/M cm) at 284 nm (1)

Reaction quantum yield, ϕ No Information at _____ nm

Direct photolysis rate constant, k_p , at ... $<1.2 \times 10^{-3}$ 1/hr When NO₂ is added
Photolysis rate is 0.37 1/hr (2)

b. Oxidation constants at 25°C:

For 1O_2 (singlet oxygen), k_{ox} No Information 1/M hr

For RO_2 (peroxy radical), k_{ox} No Information 1/M hr

c. Five-day biochemical oxygen demand, BOD_5 ... Not applicable due to reaction with water mg/l

d. Biotransformation rate constant:

For bacterial transformation in water, k_b ... No oxygen consumed 1/hr

Specify culture In modified MITI test (3)

e. Hydrolysis rate constants:

For base-promoted process, k_b No Information 1/M hr

For acid-promoted process, k_a No Information 1/M hr

For neutral process, k_n No Information 1/hr

f. Chemical reduction rate (specify conditions) Not Expected

g. Other (such as spontaneous degradation) ... Polyurea formation under hydrolytic conditions. (4)

☐ Mark (X) this box if you attach a continuation sheet.

PART B PARTITION COEFFICIENTS

5.02 a. Specify the half-life of the listed substance in the following media.

<u>Media</u>	<u>Half-life (specify units)</u>
Groundwater	<u>1 day in water solution (4)</u>
Atmosphere	<u>26 hr. (2)</u>
Surface water	<u>1 day in water solution (4)</u>
Soil	<u>1 day (4)</u>

b. Identify the listed substance's known transformation products that have a half-life greater than 24 hours.

<u>CAS No.</u>	<u>Name</u>	<u>Half-life (specify units)</u>	<u>Media</u>
	<u>Polyurea</u>	<u>1 hr.</u>	<u>in Water and soil (4)</u>
<u>95-80-7</u>	<u>2,4-Tolvene diamine</u>	<u>1 day</u>	<u>in Biological waste</u>
<u>823-40-5</u>	<u>2,6-Tolvene diamine</u>	<u>1 day</u>	<u>in water treatment plt</u>
<u>5206-52-0</u>	<u>Urea, N,N-bis (3-isocyanate-4 methylphenol</u> <u>unknown half-life.</u>		<u>in (5,6)</u>

5.03 Specify the octanol-water partition coefficient, K_{ow} ... reacts with both at 25°C
Method of calculation or determination octanol and water

5.04 Specify the soil-water partition coefficient, K_d reacts with at 25°C
Soil type water

5.05 Specify the organic carbon-water partition coefficient, K_{oc} reacts with at 25°C
water

5.06 Specify the Henry's Law Constant, H reacts with atm-m³/mole
water.

☐ Mark (X) this box if you attach a continuation sheet.

5.07 List the bioconcentration factor (BCF) of the listed substance, the species for which it was determined, and the type of test used in deriving the BCF.

<u>Bioconcentration Factor</u>	<u>Species</u>	<u>Test</u> ¹
<u>None detected</u>	<u>Moina Macrocopa Straus</u>	<u>Not defined (4)</u>
<u>None detected</u>	<u>Cyprnius Carpio</u>	<u>Not defined (4)</u>
<u> </u>	<u> </u>	<u> </u>

¹Use the following codes to designate the type of test:

F = Flowthrough
S = Static

- (1) Phillips and Nachod, eds., Organic Electronic Spectral Data, Vol IV, pg. 200.
- (2) K.H. Becker, V. Bastian and TH. Klein, The reactions fo tolUene diisocyanate, toluene diamine and methylene draniline under simulated atmospheric conditions, J. Photochem and Photobiol., A: Chemistry, 45 (1988) 195-205.
- (3) N. Caspers, B. Hamburger, R. Kanne and Waklebert, Ecotoxicity of TDI, MDI, TDA and MDA, report to the International Isocyanate Institute, E-CE-41, 1986.

Quoted in D.S. Gilbert, Fate of TDI and MDI in Air, Soil and Water, Polyurethanes World Congress 1987, Proceedings of the SPI/FSK.

- (4) F.K. Brochhagen and B.M. Grievenson, Environmental aspects of isocyanates in water and soil, Cellular Polymers, 3 (1984) 11-17.
- (5) K. Marcali, Microdetermination of toluene dissocyanate in atmosphere, Anal. Chem 29 (1975) 552-558.
- (6) G.A. Campbell, T.J. Dearlove and W.C. Meluch, Di(isocyanatoltolyl) urea, U.S. Patent 3,906,019(1975), Chem. Abs. 84: 5645h.

☐ Mark (X) this box if you attach a continuation sheet.

SECTION 7 MANUFACTURING AND PROCESSING INFORMATION

General Instructions:

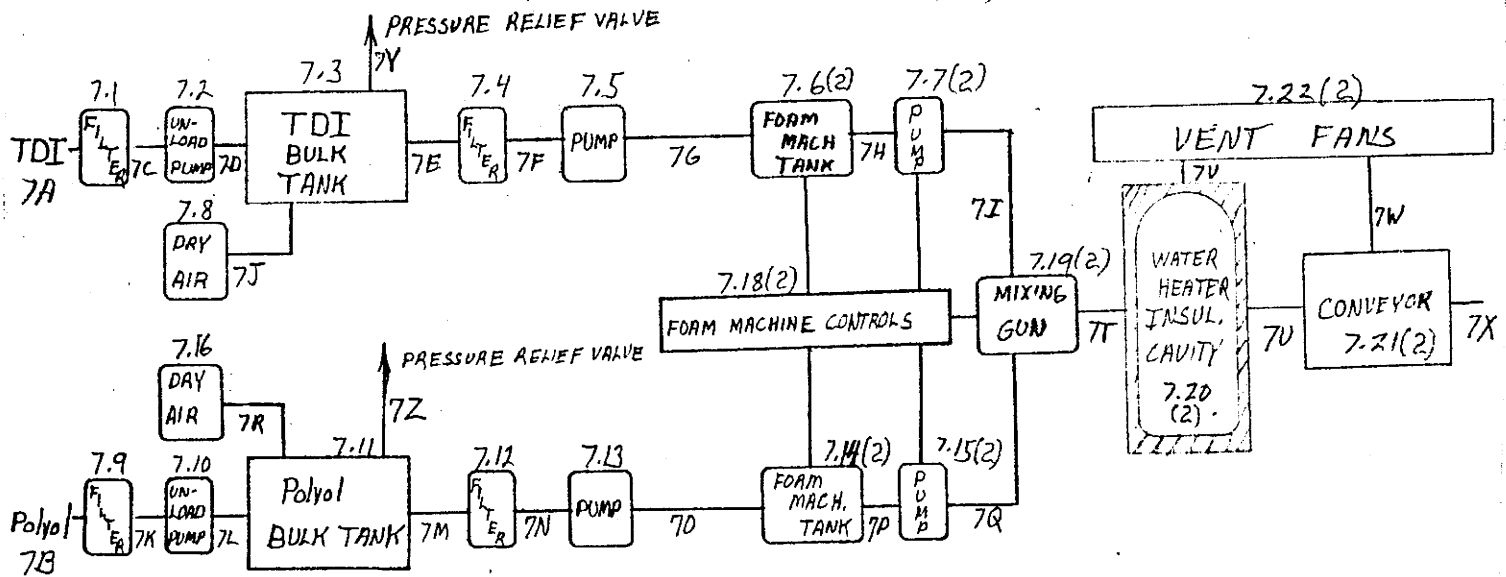
For questions 7.04-7.06, provide a separate response for each process block flow diagram provided in questions 7.01, 7.02, and 7.03. Identify the process type from which the information is extracted.

PART A MANUFACTURING AND PROCESSING PROCESS TYPE DESCRIPTION

7.01 In accordance with the instructions, provide a process block flow diagram showing the major (greatest volume) process type involving the listed substance.

CBI

☐ Process type Polyurethane Foam Insulating Process

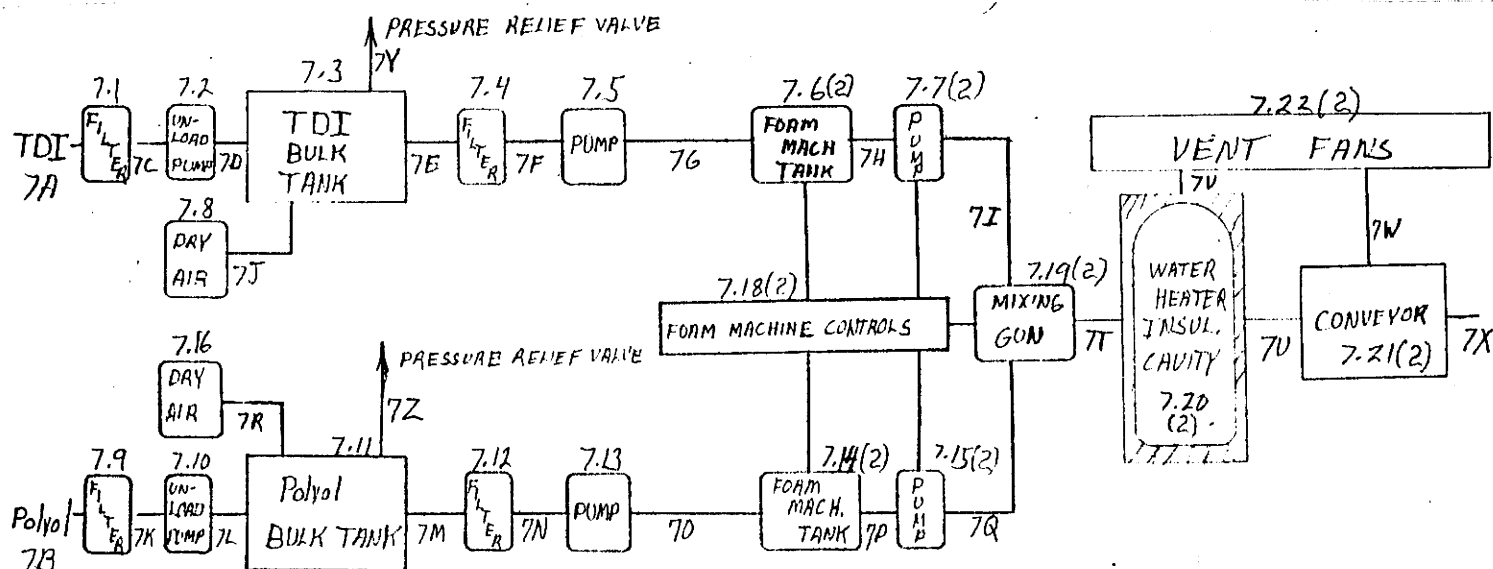


☐ Mark (X) this box if you attach a continuation sheet.

7.03 In accordance with the instructions, provide a process block flow diagram showing all process emission streams and emission points that contain the listed substance and which, if combined, would total at least 90 percent of all facility emissions if not treated before emission into the environment. If all such emissions are released from one process type, provide a process block flow diagram using the instructions for question 7.01. If all such emissions are released from more than one process type, provide a process block flow diagram showing each process type as a separate block.

CBI

☐ Process type Polyurethane Foam Insulating Process



TDI Emissions
 7.1, 7.4 Filters
 7.2, 7.5, 7.7 Pump Seals
 7.22 Vent Fans
 7Y TDI Bulk Tank Relief Valve

☐ Mark (X) this box if you attach a continuation sheet.

7.04 Describe the typical equipment types for each unit operation identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type.

CBI

☐ Process type Polyurethane Foam Insulating Process

Unit Operation ID Number	Typical Equipment Type	Operating Temperature Range (°C)	Operating Pressure Range (mm Hg)	Vessel Composition
<u>7.1, 7.4, 7.9, 7.12</u>	<u>Reusable Filter</u>	<u>21 -27 deg.</u>	<u>260-520</u>	<u>Stainless Steel</u>
<u>7.2, 7.5, 7.10, 7.13</u>	<u>Pump</u>	<u>21-27 deg.</u>	<u>260-520</u>	<u>Steel</u>
<u>7.3</u>	<u>TDI Bulk Tank</u>	<u>21-27 deg.</u>	<u>260-520</u>	<u>Steel</u>
<u>7.11</u>	<u>Polyol Bulk Tank</u>	<u>21-27 deg.</u>	<u>260-520</u>	<u>Steel</u>
<u>7.6</u>	<u>Foam Mach. Tank-TDI</u>	<u>32 deg.</u>	<u>3000-5000</u>	<u>Steel</u>
<u>7.7</u>	<u>Pump</u>	<u>32 deg.</u>	<u>3000-5000</u>	<u>Steel</u>
<u>7.14</u>	<u>Foam Mach. Tank-Polyol</u>	<u>23 deg.</u>	<u>3000-5000</u>	<u>Steel</u>
<u>7.15</u>	<u>Pump</u>	<u>23 deg.</u>	<u>3000-5000</u>	<u>Steel</u>
<u>7.19</u>	<u>Mixing Gun</u>	<u>25-30 deg.</u>	<u>3000-5000</u>	<u>Steel</u>
<u>7.20</u>	<u>Water Heater Cavity Mold.</u>	<u>AMBIENT</u>	<u>ATMOSPHERIC</u>	<u>Steel</u>
<u>7.21</u>	<u>Conveyor</u>	<u>AMBIENT</u>	<u>ATMOSPHERIC</u>	<u>Steel & Rubber</u>
<u>7.22</u>	<u>Vent Fans</u>	<u>AMBIENT</u>	<u>ATMOSPHERIC</u>	<u>STEEL</u>

☐ Mark (X) this box if you attach a continuation sheet.

7.05 Describe each process stream identified in your process block flow diagram(s). If a process block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type.

CBI

☐ Process type Polyurethane Foam Insulating Process

Process Stream ID Code	Process Stream Description	Physical State ¹	Stream Flow (kg/yr)
<u>7A, 7L, 7D, 7E, 7F, 7G, 7H, 7I</u>	<u>TDI Pipe Lines</u>	<u>OL</u>	<u>470,000 kg</u>
<u>7B, 7K, 7L, 7M, 7N, 7O, 7P, 7Q</u>	<u>Polyol Pipe Lines</u>	<u>OL</u>	<u>550,000 kg.</u>
<u>7J, 7R</u>	<u>Dry Air Lines</u>	<u>GU</u>	<u>UK</u>
<u>7Y</u>	<u>TDI Tank Pressure Relief Valve</u>	<u>GU</u>	<u>0 under normal conditions</u>
<u>7Z</u>	<u>Polyol Tank Pressure Relief Valve.</u>	<u>GU</u>	<u>0 under normal conditions.</u>
<u>7T</u>	<u>Cavity Injection Stream</u>	<u>OL</u>	<u>1,020,000 kg</u>
<u>7U, 7X</u>	<u>Finished Product To Storage</u>	<u>SO</u>	<u>1,020,000 kg</u>
<u>7V, 7W</u>	<u>Vents to Outside for Vapors from curing process</u>	<u>GU</u>	<u>UK</u>

¹Use the following codes to designate the physical state for each process stream:

GC = Gas (condensable at ambient temperature and pressure)
 GU = Gas (uncondensable at ambient temperature and pressure)
 SO = Solid
 SY = Sludge or slurry
 AL = Aqueous liquid
 OL = Organic liquid
 IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

☐ Mark (X) this box if you attach a continuation sheet.

7.06 Characterize each process stream identified in your process block flow diagram(s).
If a process block flow diagram is provided for more than one process type, photocopy
this question and complete it separately for each process type. (Refer to the
CBI instructions for further explanation and an example.)

☐ Process type Polyurethane Foam Insulating Process

a.	b.	c.	d.	e.
Process Stream ID Code	Known Compounds ¹	Concen- trations ^{2,3} (% or ppm)	Other Expected Compounds	Estimated Concentrations (% or ppm)
<u>7A,7C,7D,7E</u> <u>7F,7G,7H,7I</u>	<u>TDI</u>	<u>100%</u>	<u>NA</u>	<u>NA</u>
<u>7B,7K,7L,7M</u> <u>7N,7O,7P,7Q</u>	<u>Polyol</u>	<u>100%</u>	<u>NA</u>	<u>NA</u>
<u>7T</u>	<u>TDI</u>	<u>47%</u>	<u>NA</u>	<u>NA</u>
	<u>Polyol</u>	<u>53%</u>	<u>NA</u>	<u>NA</u>
<u>7U, 7X</u>	<u>Polyurethane Foam</u>	<u>100%</u>	<u>NA</u>	<u>NA</u>

7.06 continued below

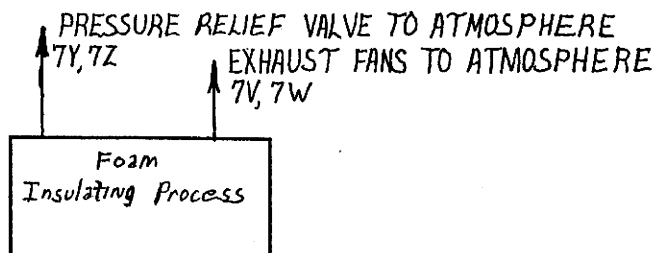
☐ Mark (X) this box if you attach a continuation sheet.

PART A RESIDUAL TREATMENT PROCESS DESCRIPTION

8.01 In accordance with the instructions, provide a residual treatment block flow diagram which describes the treatment process used for residuals identified in question 7.01.

CBI

☐ Process type Polyurethane Foam Insulating Process



☐ Mark (X) this box if you attach a continuation sheet.

PART B RESIDUAL GENERATION AND CHARACTERIZATION

8.05 Characterize each process stream identified in your residual treatment block flow diagram(s). If a residual treatment block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the instructions for further explanation and an example.)

☐ Process type Polyurethane Foam Insulating Process

a.	b.	c.	d.	e.	f.	g.
Stream ID Code	Type of Hazardous Waste ¹	Physical State of Residual ²	Known Compounds ³	Concentrations (% or ppm) ^{4,5,6}	Other Expected Compounds	Estimated Concentrations (% or ppm)
<u>7Y</u>	<u>T</u>	<u>GU</u>	<u>Air</u>	<u>UK</u>		
		<u>GU</u>	<u>TDI</u>	<u>UK</u>		
<u>7Z</u>	<u>T</u>	<u>GU</u>	<u>Air</u>	<u>UK</u>		
		<u>GU</u>	<u>Trichlorofluoromethane</u>	<u>UK</u>		
		<u>GU</u>	<u>Aliphatic Amine</u>	<u>UK</u>		
		<u>GU</u>	<u>Diethylene Glycol</u>	<u>UK</u>		
<u>7V, 7W</u>	<u>T</u>	<u>GU</u>	<u>Air</u>	<u>UK</u>		
		<u>GU</u>	<u>TDI</u>	<u>UK</u>		
		<u>GU</u>	<u>Trichlorofluoromethane</u>	<u>UK</u>		
		<u>GU</u>	<u>Aliphatic Amine</u>	<u>UK</u>		
		<u>GU</u>	<u>Diethylene Glycol</u>	<u>UK</u>		

8.05 continued below

☐ Mark (X) this box if you attach a continuation sheet.

8.06 Characterize each process stream identified in your residual treatment block flow diagram(s). If a residual treatment block flow diagram is provided for more than one process type, photocopy this question and complete it separately for each process type. (Refer to the instructions for further explanation and an example.)

CBI

☐ Process type Polyuethane Foam Insulating Process

a.	b.	c.	d.	e.	f.	g.
Stream ID Code	Waste Description Code ¹	Management Method Code ²	Residual Quantities (kg/yr)	Management of Residual (%) On-Site Off-Site	Costs for Off-Site Management (per kg)	Changes in Management Methods
7V	B91	M5(a)	UK	100%	NA	None
7W	B91	M5(a)	UK	100%	NA	None
7Y	B91	M5(a)	UK	100%	NA	None
7Z	B91	M5(a)	UK	100%	NA	None

¹Use the codes provided in Exhibit 8-1 to designate the waste descriptions

²Use the codes provided in Exhibit 8-2 to designate the management methods

☐ Mark (X) this box if you attach a continuation sheet.

PART A EMPLOYMENT AND POTENTIAL EXPOSURE PROFILE

9.01 Mark (X) the appropriate column to indicate whether your company maintains records on the following data elements for hourly and salaried workers. Specify for each data element the year in which you began maintaining records and the number of years the records for that data element are maintained. (Refer to the instructions for further explanation and an example.)

CBI

[*]

Data Element	Data are Maintained for:		Year in Which Data Collection Began	Number of Years Records Are Maintained
	Hourly Workers	Salaried Workers		
Date of hire	_____	_____	_____	_____
Age at hire	_____	_____	_____	_____
Work history of individual before employment at your facility	_____	_____	_____	_____
Sex	_____	_____	_____	_____
Race	_____	_____	_____	_____
Job titles	_____	_____	_____	_____
Start date for each job title	_____	_____	_____	_____
End date for each job title	_____	_____	_____	_____
Work area industrial hygiene monitoring data	_____	_____	_____	_____
Personal employee monitoring data	_____	_____	_____	_____
Employee medical history	_____	_____	_____	_____
Employee smoking history	_____	_____	_____	_____
Accident history	_____	_____	_____	_____
Retirement date	_____	_____	_____	_____
Termination date	_____	_____	_____	_____
Vital status of retirees	_____	_____	_____	_____
Cause of death data	_____	_____	_____	_____

*All data maintained in individual employee's personell file.

[] Mark (X) this box if you attach a continuation sheet.

9.02 In accordance with the instructions, complete the following table for each activity in which you engage.

CBI

☐

a.	b.	c.	d.	e.
<u>Activity</u>	<u>Process Category</u>	<u>Yearly Quantity (kg)</u>	<u>Total Workers</u>	<u>Total Worker-Hours</u>
Manufacture of the listed substance	Enclosed	NA	NA	NA
	Controlled Release	NA	NA	NA
	Open	NA	NA	NA
On-site use as reactant	Enclosed	NA	NA	NA
	Controlled Release	470,000	30	13,000
	Open	NA	NA	NA
On-site use as nonreactant	Enclosed	NA	NA	NA
	Controlled Release	NA	NA	NA
	Open	NA	NA	NA
On-site preparation of products	Enclosed	NA	NA	NA
	Controlled Release	NA	NA	NA
	Open	NA	NA	NA

☐ Mark (X) this box if you attach a continuation sheet.

9.03 Provide a descriptive job title for each labor category at your facility that encompasses workers who may potentially come in contact with or be exposed to the listed substance.

CBI

☐

Labor Category

Descriptive Job Title

A Foam Machine Operator

B Assembler

C Quality Control Inspector

D Supervision

E Maintenance Worker

F Receiving Dept Worker

G _____

H _____

I _____

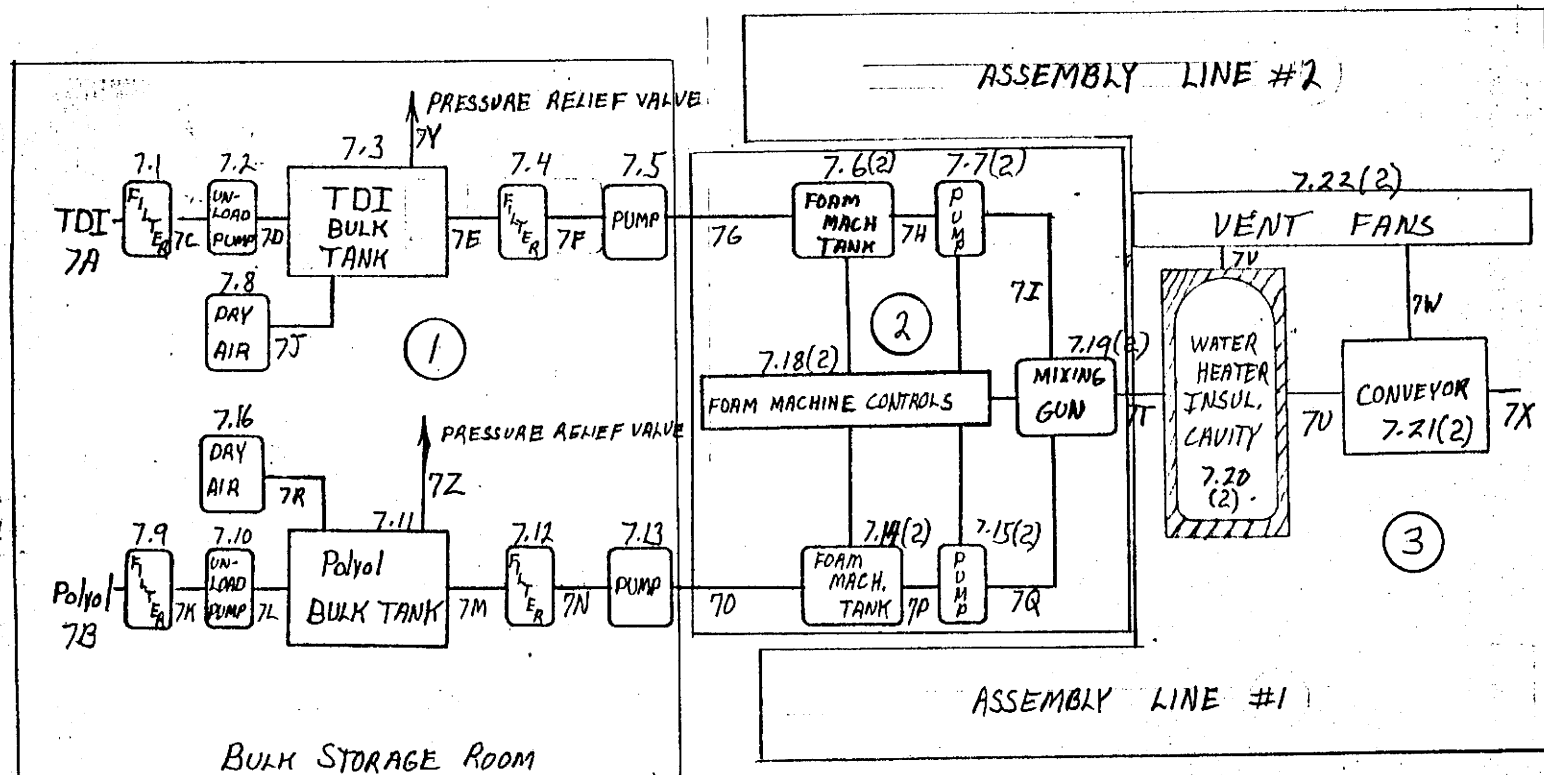
J _____

☐ Mark (X) this box if you attach a continuation sheet.

9.04 In accordance with the instructions, provide your process block flow diagram(s) and indicate associated work areas.

CBI

☐ Process type Polyurethane Foam Insulating Process



☐ Mark (X) this box if you attach a continuation sheet.

9.05 Describe the various work area(s) shown in question 9.04 that encompass workers who may potentially come in contact with or be exposed to the listed substance. Add any additional areas not shown in the process block flow diagram in question 7.01 or 7.02. Photocopy this question and complete it separately for each process type.

CBI

☐ Process type Polyurethane Foam Insulating Process

Work Area ID

Description of Work Areas and Worker Activities

1	<u>Bulk Storage Room (workers unload trucks and maintain equipment).</u>
2	<u>Foam Machines (workers operate foam machine controls and fill product).</u>
3	<u>Assembly Lines (workers inspect and package finished product).</u>
4	<u>_____</u>
5	<u>_____</u>
6	<u>_____</u>
7	<u>_____</u>
8	<u>_____</u>
9	<u>_____</u>
10	<u>_____</u>

☐ Mark (X) this box if you attach a continuation sheet.

9.06 Complete the following table for each work area identified in question 9.05, and for each labor category at your facility that encompasses workers who may potentially come in contact with or be exposed to the listed substance. Photocopy this question and complete it separately for each process type and work area.

☐ Process type Polyurethane Foam Insulating Process

Work area 1

Labor Category	Number of Workers Exposed	Mode of Exposure (e.g., direct skin contact)	Physical State of Listed Substance ¹	Average Length of Exposure Per Day ²	Number of Days per Year Exposed
E	2	inhalation, skin contact	OL, GU	A	52
F	1	inhalation, skin contact	OL, GU	C	24

¹Use the following codes to designate the physical state of the listed substance at the point of exposure:

GC = Gas (condensable at ambient temperature and pressure)
 GU = Gas (uncondensable at ambient temperature and pressure; includes fumes, vapors, etc.)
 SO = Solid

SY = Sludge or slurry
 AL = Aqueous liquid
 OL = Organic liquid
 IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

²Use the following codes to designate average length of exposure per day:

A = 15 minutes or less
 B = Greater than 15 minutes, but not exceeding 1 hour
 C = Greater than one hour, but not exceeding 2 hours

D = Greater than 2 hours, but not exceeding 4 hours
 E = Greater than 4 hours, but not exceeding 8 hours
 F = Greater than 8 hours

☐ Mark (X) this box if you attach a continuation sheet.

9.06 Complete the following table for each work area identified in question 9.05, and for each labor category at your facility that encompasses workers who may potentially come in contact with or be exposed to the listed substance. Photocopy this question and complete it separately for each process type and work area.

☐ Process type Polyurethane Foam Insulating Process

Work area 2

Labor Category	Number of Workers Exposed	Mode of Exposure (e.g., direct skin contact)	Physical State of Listed Substance ¹	Average Length of Exposure Per Day ²	Number of Days per Year Exposed
A	4	inhalation, skin contact	GU	D	256
B	4	inhalation	GU	B	256
D	4	inhalation	GU	B	256

¹Use the following codes to designate the physical state of the listed substance at the point of exposure:

GC = Gas (condensable at ambient temperature and pressure)	SY = Sludge or slurry
GU = Gas (uncondensable at ambient temperature and pressure; includes fumes, vapors, etc.)	AL = Aqueous liquid
SO = Solid	OL = Organic liquid
	IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

²Use the following codes to designate average length of exposure per day:

A = 15 minutes or less	D = Greater than 2 hours, but not exceeding 4 hours
B = Greater than 15 minutes, but not exceeding 1 hour	E = Greater than 4 hours, but not exceeding 8 hours
C = Greater than one hour, but not exceeding 2 hours	F = Greater than 8 hours

☐ Mark (X) this box if you attach a continuation sheet.

9.06 Complete the following table for each work area identified in question 9.05, and for each labor category at your facility that encompasses workers who may potentially come in contact with or be exposed to the listed substance. Photocopy this question and complete it separately for each process type and work area.

☐ Process type Polyurethane Foam Insulating Process

Work area 3

Labor Category	Number of Workers Exposed	Mode of Exposure (e.g., direct skin contact)	Physical State of Listed Substance ¹	Average Length of Exposure Per Day ²	Number of Days per Year Exposed
B	8	Inhalation	GU	D	256
C	4	Inhalation	GU	D	256
D	4	Inhalation	GU	D	256

¹Use the following codes to designate the physical state of the listed substance at the point of exposure:

GC = Gas (condensible at ambient temperature and pressure)
 GU = Gas (uncondensable at ambient temperature and pressure; includes fumes, vapors, etc.)
 SO = Solid

SY = Sludge or slurry
 AL = Aqueous liquid
 OL = Organic liquid
 IL = Immiscible liquid (specify phases, e.g., 90% water, 10% toluene)

²Use the following codes to designate average length of exposure per day:

A = 15 minutes or less
 B = Greater than 15 minutes, but not exceeding 1 hour
 C = Greater than one hour, but not exceeding 2 hours

D = Greater than 2 hours, but not exceeding 4 hours
 E = Greater than 4 hours, but not exceeding 8 hours
 F = Greater than 8 hours

☐ Mark (X) this box if you attach a continuation sheet.

9.07 For each labor category represented in question 9.06, indicate the 8-hour Time Weighted Average (TWA) exposure levels and the 15-minute peak exposure levels. Photocopy this question and complete it separately for each process type and work area.

CBI

☐ Process type Polyurethane Foam Insulating Process

Work area 1

<u>Labor Category</u>	<u>8-hour TWA Exposure Level (ppm, mg/m³, other-specify)</u>	<u>15-Minute Peak Exposure Level (ppm, mg/m³, other-specify)</u>
<u>E</u>	<u>No Information</u>	<u>No Information</u>
<u>F</u>	<u>No Information</u>	<u>No Information</u>
<u> </u>	<u> </u>	<u> </u>
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☐ Mark (X) this box if you attach a continuation sheet.

9.07 For each labor category represented in question 9.06, indicate the 8-hour Time Weighted Average (TWA) exposure levels and the 15-minute peak exposure levels. Photocopy this question and complete it separately for each process type and work area.

CBI

☐ Process type Polyurethane Foam Insulating Process

Work area 2

Labor Category	8-hour TWA Exposure Level (ppm, mg/m ³ , other-specify)	15-Minute Peak Exposure Level (ppm, mg/m ³ , other-specify)
<u>A</u>	<u>< 0.0013 mg/m³</u>	<u>No Information</u>
<u>B</u>	<u>< 0.0013 mg/m³</u>	<u>No Information</u>
<u>C</u>	<u>< 0.0013 mg/m³</u>	<u>No Information</u>
<u> </u>	<u> </u>	<u> </u>
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☐ Mark (X) this box if you attach a continuation sheet.

9.07 For each labor category represented in question 9.06, indicate the 8-hour Time Weighted Average (TWA) exposure levels and the 15-minute peak exposure levels. Photocopy this question and complete it separately for each process type and work area.

CBI

☐ Process type Polyurethane Foam Insulating Process

Work area 3

Labor Category	8-hour TWA Exposure Level (ppm, mg/m ³ , other-specify)	15-Minute Peak Exposure Level (ppm, mg/m ³ , other-specify)
<u>B</u>	<u><.0013 mg m³</u>	<u>No Information</u>
<u>C</u>	<u><.0013 mg m³</u>	<u>No Information</u>
<u>D</u>	<u><.0013 mg m³</u>	<u>No Information</u>
<u> </u>	<u> </u>	<u> </u>
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☐ Mark (X) this box if you attach a continuation sheet.

PART C ENGINEERING CONTROLS

9.12 Describe the engineering controls that you use to reduce or eliminate worker exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

☐ Process type Polyurethane Foam Insulating Process

Work area 1

<u>Engineering Controls</u>	<u>Used (Y/N)</u>	<u>Year Installed</u>	<u>Upgraded (Y/N)</u>	<u>Year Upgraded</u>
Ventilation:				
Local exhaust	<u>N</u>	<u> </u>	<u> </u>	<u> </u>
General dilution	<u>N</u>	<u> </u>	<u> </u>	<u> </u>
Other (specify) <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Vessel emission controls	<u>Y</u>	<u>1981</u>	<u>N</u>	<u> </u>
Mechanical loading or packaging equipment	<u>Y</u>	<u>1981</u>	<u>N</u>	<u> </u>
Other (specify) <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>

☐ Mark (X) this box if you attach a continuation sheet.

9.12 Describe the engineering controls that you use to reduce or eliminate worker exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

[] Process type Polyurethane Foam Insulating Process

Engineering Controls	Used (Y/N)	Year Installed	Upgraded (Y/N)	Year Upgraded
----------------------	---------------	-------------------	-------------------	------------------

Local exhaust	Y	<u>1981</u>	<u>N</u>	<u> </u>
---------------	---	-------------	----------	-------------------

General dilution	Y	<u>1981</u>	<u>N</u>	
------------------	---	-------------	----------	--

Other (specify) _____

Vessel emission controls N _____

Mechanical loading or packaging equipment	N				
---	---	--	--	--	--

Other (specify) _____

98

PART C ENGINEERING CONTROLS

9.12 Describe the engineering controls that you use to reduce or eliminate worker exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

☐ Process type Polyurethane Foam Insulating Process

Work area 3

<u>Engineering Controls</u>	<u>Used (Y/N)</u>	<u>Year Installed</u>	<u>Upgraded (Y/N)</u>	<u>Year Upgraded</u>
Ventilation:				
Local exhaust	<u>Y</u>	<u>1981</u>	<u> </u>	<u> </u>
General dilution	<u>Y</u>	<u>1981</u>	<u> </u>	<u> </u>
Other (specify) <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Vessel emission controls	<u>N</u>	<u> </u>	<u> </u>	<u> </u>
Mechanical loading or packaging equipment	<u>N</u>	<u> </u>	<u> </u>	<u> </u>
Other (specify) <u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>

☐ Mark (X) this box if you attach a continuation sheet.

PART D PERSONAL PROTECTIVE AND SAFETY EQUIPMENT

9.14 Describe the personal protective and safety equipment that your workers wear or use in each work area in order to reduce or eliminate their exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

[] Process type Polyurethane Foam Insulating Process

Work area 1

<u>Equipment Types</u>	<u>Wear or Use (Y/N)</u>
Respirators	<u>Y</u>
Safety goggles/glasses	<u>Y</u>
Face shields	<u>N</u>
Coveralls	<u>N</u>
Bib aprons	<u>N</u>
Chemical-resistant gloves	<u>Y</u>
Other (specify)	
_____	_____
_____	_____

[] Mark (X) this box if you attach a continuation sheet.

PART D PERSONAL PROTECTIVE AND SAFETY EQUIPMENT

9.14 Describe the personal protective and safety equipment that your workers wear or use in each work area in order to reduce or eliminate their exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

☐ Process type Polyurethane Foam Insulating Process

Work area 2

<u>Equipment Types</u>	<u>Wear or Use (Y/N)</u>
Respirators	<u>N</u>
Safety goggles/glasses	<u>Y</u>
Face shields	<u>N</u>
Coveralls	<u>N</u>
Bib aprons	<u>N</u>
Chemical-resistant gloves	<u>N</u>
Other (specify)	
_____	_____
_____	_____

☐ Mark (X) this box if you attach a continuation sheet.

PART D PERSONAL PROTECTIVE AND SAFETY EQUIPMENT

9.14 Describe the personal protective and safety equipment that your workers wear or use in each work area in order to reduce or eliminate their exposure to the listed substance. Photocopy this question and complete it separately for each process type and work area.

CBI

☐ Process type Polyurethane Foam Insulating Process

Work area 3

<u>Equipment Types</u>	<u>Wear or Use (Y/N)</u>
Respirators	<u>N</u>
Safety goggles/glasses	<u>Y</u>
Face shields	<u>N</u>
Coveralls	<u>N</u>
Bib aprons	<u>N</u>
Chemical-resistant gloves	<u>N</u>
Other (specify)	
_____	_____
_____	_____

☐ Mark (X) this box if you attach a continuation sheet.

9.15 If workers use respirators when working with the listed substance, specify for each process type, the work areas where the respirators are used, the type of respirators used, the average usage, whether or not the respirators were fit tested, and the type and frequency of the fit tests. Photocopy this question and complete it separately for each process type.

CBI

☐ Process type Polyurethane Foam Insulating Process

Work Area	Respirator Type	Average Usage ¹	Fit Tested (Y/N)	Type of Fit Test ²	Frequency of Fit Tests (per year)
1	Cartridge Type	E	N	NA	NA

¹Use the following codes to designate average usage:

A = Daily

B = Weekly

C = Monthly

D = Once a year

E = Other (specify) When unloading tanker truck-bi weekly

²Use the following codes to designate the type of fit test:

QL = Qualitative

QT = Quantitative

☐ Mark (X) this box if you attach a continuation sheet.

- 9.16 Respirator Maintenance Program -- For each type of respirator used when working with the listed substance, specify the frequency of the maintenance activity, and the person who performs the maintenance activity. Photocopy this question and complete it separately for each respirator type.

Respirator type Cartridge Type

<u>Respirator Maintenance Activity</u>	<u>Frequency¹</u>	<u>Person Performing Activity²</u>
Cleaning	<u>A</u>	<u>C</u>
Inspection	<u>C</u>	<u>C</u>
Replacement		
Cartridge/Canister	<u>C</u>	<u>C</u>
Respirator unit	<u> </u>	<u> </u>

¹Use the following codes to designate the frequency of maintenance activity:

A = After each use

B = Weekly

C = Other (specify) Monthly

²Use the following codes to designate who performs the maintenance activity:

A = Plant industrial hygienist

B = Supervisor

C = Foreman

D = Other (specify)

☐ Mark (X) this box if you attach a continuation sheet.

9.17 Respirator Training Program -- Describe your respirator training and re-training programs for each type of respirator used when working with the listed substance. Photocopy this question and complete it separately for each respirator type.

a.

Respirator type Cartridge Type

Type of Training ¹	Number of Workers Trained	Location of Training ²	Length of Training (hrs)	Person Performing Training ³	Frequency ⁴
R	4	C	1	C	C

b.

Respirator type

Type of Re-training ¹	Number of Workers Re-trained	Location of Re-Training ²	Length of Re-Training (hrs)	Person Performing Re-Training ³	Frequency ⁴

¹Use the following codes to designate the type of training or re-training:

E = Emergency
R = Routine

²Use the following codes to designate the location of training or re-training:

A = Outside plant instruction
B = In-house classroom instruction
C = On-the-job
D = Other (specify) _____

³Use the following codes to designate the person who performs the training or re-training:

A = Plant industrial hygienist
B = Supervisor
C = Foreman
D = Other (specify) _____

⁴Use the following codes to designate the frequency of respirator training or re-training:

A = Monthly
B = Fixed monthly
C = Other (specify) Initial Training Only. _____

☐ Mark (X) this box if you attach a continuation sheet.

9.18 For each type of personal protective clothing and safety equipment used when working with the listed substance, indicate whether you have conducted a permeation test on the clothing or equipment for the listed substance.

<u>Clothing and Equipment</u>	<u>Permeation Tests Conducted (Y/N)</u>
Coveralls	NA
Bib apron	NA
Gloves	N
Other (specify)	
_____	NA
_____	NA
_____	NA

☐ Mark (X) this box if you attach a continuation sheet.

PART E WORK PRACTICES

- 9.19 Describe all of the work practices and administrative controls used to reduce or eliminate worker exposure to the listed substance (e.g., restrict entrance only to authorized workers, mark areas with warning signs, insure worker detection and monitoring practices, provide worker training programs, etc.). Photocopy this question and complete it separately for each process type and work area.

CBI

☐

Process type Polyurethane Foam Insulating Process

Work area 1

Area is restricted to authorized personnel and kept locked.

Area is marked with warning signs.

Yearly worker training programs.

- 9.20 Indicate (X) how often you perform each housekeeping task used to clean up routine leaks or spills of the listed substance. Photocopy this question and complete it separately for each process type and work area.

Process type Polyurethane Foam Insulating Process

Work area 1

<u>Housekeeping Tasks</u>	<u>Less Than Once Per Day</u>	<u>1-2 Times Per Day</u>	<u>3-4 Times Per Day</u>	<u>More Than 4 Times Per Day</u>
Sweeping	<u>X</u>	<u> </u>	<u> </u>	<u> </u>
Vacuuming	<u>NA</u>	<u> </u>	<u> </u>	<u> </u>
Water flushing of floors	<u>NA</u>	<u> </u>	<u> </u>	<u> </u>
Other (specify)	<u> </u>	<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>

☐ Mark (X) this box if you attach a continuation sheet.

PART E WORK PRACTICES

- 9.19 Describe all of the work practices and administrative controls used to reduce or eliminate worker exposure to the listed substance (e.g., restrict entrance only to authorized workers, mark areas with warning signs, insure worker detection and monitoring practices, provide worker training programs, etc.). Photocopy this question and complete it separately for each process type and work area.

CBI

☐

Process type Polyurethane Foam Insulating Process

Work area 2

Area marked by warning signs.

Yearly worker training programs.

-
- 9.20 Indicate (X) how often you perform each housekeeping task used to clean up routine leaks or spills of the listed substance. Photocopy this question and complete it separately for each process type and work area.

Process type Polyurethane Foam Insulating Process

Work area 2

Housekeeping Tasks	Less Than Once Per Day	1-2 Times Per Day	3-4 Times Per Day	More Than 4 Times Per Day
Sweeping	X			
Vacuuming	NA			
Water flushing of floors	NA			
Other (specify)				

☐ Mark (X) this box if you attach a continuation sheet.

PART E WORK PRACTICES

- 9.19 Describe all of the work practices and administrative controls used to reduce or eliminate worker exposure to the listed substance (e.g., restrict entrance only to authorized workers, mark areas with warning signs, insure worker detection and monitoring practices, provide worker training programs, etc.). Photocopy this question and complete it separately for each process type and work area.

CBI

☐

Process type Polyurethane Foam Insulating Process

Work area 3

Area is marked with warning signs.

Yearly worker training programs.

-
- 9.20 Indicate (X) how often you perform each housekeeping task used to clean up routine leaks or spills of the listed substance. Photocopy this question and complete it separately for each process type and work area.

Process type Polyurethane Foam Insulating Process

Work area 3

<u>Housekeeping Tasks</u>	<u>Less Than Once Per Day</u>	<u>1-2 Times Per Day</u>	<u>3-4 Times Per Day</u>	<u>More Than 4 Times Per Day</u>
Sweeping	<u>X</u>	<u> </u>	<u> </u>	<u> </u>
Vacuuming	<u>NA</u>	<u> </u>	<u> </u>	<u> </u>
Water flushing of floors	<u>NA</u>	<u> </u>	<u> </u>	<u> </u>
Other (specify)				
<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>

☐ Mark (X) this box if you attach a continuation sheet.

9.21 Do you have a written medical action plan for responding to routine or emergency exposure to the listed substance?

Routine exposure

Yes 1

No ②

Emergency exposure

Yes ①

No 2

If yes, where are copies of the plan maintained?

Routine exposure: _____

Emergency exposure: Assembly Office, Safety Office.

9.22 Do you have a written leak and spill cleanup plan that addresses the listed substance? Circle the appropriate response.

Yes ①

No 2

If yes, where are copies of the plan maintained? Assembly, Safety Office.

Has this plan been coordinated with state or local government response organizations? Circle the appropriate response.

Yes ①

No 2

9.23 Who is responsible for monitoring worker safety at your facility? Circle the appropriate response.

Plant safety specialist ①

Insurance carrier 2

OSHA consultant 3

Other (specify) _____ 4

☐ Mark (X) this box if you attach a continuation sheet.

9.24 Who is responsible for safety and health training at your facility? Circle the appropriate response.

- Plant safety specialist ①
Insurance carrier 2
OSHA consultant 3
Other (specify) _____ 4

9.25 Who is responsible for the medical program at your facility? Circle the appropriate response.

- Plant physician 1
Consulting physician 2
Plant nurse ③
Consulting nurse 4
Other (specify) _____ 5

☐ Mark (X) this box if you attach a continuation sheet.

SECTION 10 ENVIRONMENTAL RELEASE

General Instructions:

Complete Part E (questions 10.23-10.35) for each non-routine release involving the listed substance that occurred during the reporting year. Report on all releases that are equal to or greater than the listed substance's reportable quantity value, RQ, unless the release is federally permitted as defined in 42 U.S.C. 9601, or is specifically excluded under the definition of release as defined in 40 CFR 302.3(22). Reportable quantities are codified in 40 CFR Part 302. If the listed substance is not a hazardous substance under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and, thus, does not have an RQ, then report releases that exceed 2,270 kg. If such a substance however, is designated as a CERCLA hazardous substance, then report those releases that are equal to or greater than the RQ. The facility may have answered these questions or similar questions under the Agency's Accidental Release Information Program and may already have this information readily available. Assign a number to each release and use this number throughout this part to identify the release. Releases over more than a 24-hour period are not single releases, i.e., the release of a chemical substance equal to or greater than an RQ must be reported as a separate release for each 24-hour period the release exceeds the RQ.

For questions 10.25-10.35, answer the questions for each release identified in question 10.23. Photocopy these questions and complete them separately for each release.

PART A GENERAL INFORMATION

10.01 Where is your facility located? Circle all appropriate responses.

CBI

- ☐ Industrial area ①
- Urban area ②
- Residential area ③
- Agricultural area 4
- Rural area 5
- Adjacent to a park or a recreational area 6
- Within 1 mile of a navigable waterway 7
- Within 1 mile of a school, university, hospital, or nursing home facility ⑧
- Within 1 mile of a non-navigable waterway ⑨
- Other (specify) _____ 10

☐ Mark (X) this box if you attach a continuation sheet.

10.02 Specify the exact location of your facility (from central point where process unit is located) in terms of latitude and longitude or Universal Transverse Mercader (UTM) coordinates.

Latitude 036 ° 19 ' 47 "

Longitude 082 ° 20 ' 31 "

UTM coordinates Zone _____, Northing _____, Easting _____

10.03 If you monitor meteorological conditions in the vicinity of your facility, provide the following information.

Average annual precipitation inches/year

Predominant wind direction

10.04 Indicate the depth to groundwater below your facility.

Depth to groundwater meters

10.05 For each on-site activity listed, indicate (Y/N/NA) all routine releases of the listed substance to the environment. (Refer to the instructions for a definition of CBI Y, N, and NA.)

<input type="checkbox"/>	On-Site Activity	Environmental Release		
		Air	Water	Land
	Manufacturing	NA	NA	NA
	Importing	NA	NA	NA
	Processing	Y	N	N
	Otherwise used	NA	NA	NA
	Product or residual storage	Y	N	N
	Disposal	NA	NA	NA
	Transport	NA	NA	NA

☐ Mark (X) this box if you attach a continuation sheet.

10.06 Provide the following information for the listed substance and specify the level of precision for each item. (Refer to the instructions for further explanation and an example.)

CBI

☐

Quantity discharged to the air 26⁽¹⁾ kg/yr ± ____ %

Quantity discharged in wastewaters None kg/yr ± ____ %

Quantity managed as other waste in on-site treatment, storage, or disposal units None kg/yr ± ____ %

Quantity managed as other waste in off-site treatment, storage, or disposal units None kg/yr ± ____ %

(1) Information obtained from supplier.

☐ Mark (X) this box if you attach a continuation sheet.

10.08 Describe the control technologies used to minimize release of the listed substance for each process stream containing the listed substance as identified in your process block or residual treatment block flow diagram(s). Photocopy this question and complete it separately for each process type.

CBI

☐ Process type Polyurethane Foam Insulating Process

<u>Stream ID Code</u>	<u>Control Technology</u>	<u>Percent Efficiency</u>
	(1)	

(1) No control Technology is used. TDI is released to the atmosphere.
Process is closed system except for reaction area.

☐ Mark (X) this box if you attach a continuation sheet.

PART B RELEASE TO AIR

- 10.09 Point Source Emissions -- Identify each emission point source containing the listed substance in terms of a Stream ID Code as identified in your process block or residual treatment block flow diagram(s), and provide a description of each point source. Do not include raw material and product storage vents, or fugitive emission sources (e.g., equipment leaks). Photocopy this question and complete it separately for each process type.

CBI

☐

Process type Polyurethane Foam Insulating Process

Point Source
ID Code

Description of Emission Point Source

7V, 7W

Reaction Zone Vent Fans.

☐ Mark (X) this box if you attach a continuation sheet.

☐ Mark (X) this box if you attach a continuation sheet.

10.10 Emission Characteristics - - Characterize the emissions for each Point Source ID Code identified in question 10.09 by completing the following table.

CBI

☐

Point Source ID Code	Physical State ¹	Average Emissions (kg/day)	Frequency ² (days/yr)	Duration ³ (min/day)	Average Emission Factor ⁴	Maximum Emission Rate (kg/min)	Maximum Emission Rate Frequency (events/yr)	Maximum Emission Rate Duration (min/event)
7V, 7W	V	0.10	256	360	0.00005	UK	UK	UK

¹Use the following codes to designate physical state at the point of release:

G = Gas; V = Vapor; P = Particulate; A = Aerosol; O = Other (specify) _____

²Frequency of emission at any level of emission

³Duration of emission at any level of emission

⁴Average Emission Factor — Provide estimated (\pm 25 percent) emission factor (kg of emission per kg of production of listed substance)

CBI

[]

[illegible]

³Use the following codes to designate vent type:

V = Vertical

115

10.12 If the listed substance is emitted in particulate form, indicate the particle size distribution for each Point Source ID Code identified in question 10.09. Photocopy this question and complete it separately for each emission point source.

CBI

☐

Point source ID code NA

Size Range (microns)

Mass Fraction (% ± % precision)

< 1

≥ 1 to < 10

≥ 10 to < 30

≥ 30 to < 50

≥ 50 to < 100

≥ 100 to < 500

≥ 500

Total = 100%

☐ Mark (X) this box if you attach a continuation sheet.

PART C FUGITIVE EMISSIONS

10.13 Equipment Leaks -- Complete the following table by providing the number of equipment types listed which are exposed to the listed substance and which are in service according to the specified weight percent of the listed substance passing through the component. Do this for each process type identified in your process block or residual treatment block flow diagram(s). Do not include equipment types that are not exposed to the listed substance. If this is a batch or intermittently operated process, give an overall percentage of time per year that the process type is exposed to the listed substance. Photocopy this question and complete it separately for each process type.

CBI

☐ Process type Polyurethane Foam Insulating Process
Percentage of time per year that the listed substance is exposed to this process type 100 %

Equipment Type	Number of Components in Service by Weight Percent of Listed Substance in Process Stream					Greater than 99%
	Less than 5%	5-10%	11-25%	26-75%	76-99%	
Pump seals ¹						
Packed				NA		
Mechanical				8		
Double mechanical ²				NA		
Compressor seals ¹				NA		
Flanges				7		
Valves						
Gas ³				1		
Liquid				14		
Pressure relief devices ⁴ (Gas or vapor only)				1		
Sample connections						
Gas				NA		
Liquid				2		
Open-ended lines ⁵ (e.g., purge, vent)						
Gas				1		
Liquid				3		

¹List the number of pump and compressor seals, rather than the number of pumps or compressors

10.13 continued on next page

☐ Mark (X) this box if you attach a continuation sheet.

10.13 (continued)

² If double mechanical seals are operated with the barrier (B) fluid at a pressure greater than the pump stuffing box pressure and/or equipped with a sensor (S) that will detect failure of the seal system, the barrier fluid system, or both, indicate with a "B" and/or an "S", respectively

³ Conditions existing in the valve during normal operation

⁴Report all pressure relief devices in service, including those equipped with control devices

⁵Lines closed during normal operation that would be used during maintenance operations

10.14 Pressure Relief Devices with Controls -- Complete the following table for those pressure relief devices identified in 10.13 to indicate which pressure relief devices in service are controlled. If a pressure relief device is not controlled, enter "None" under column c.

[]

[illegible]

¹Refer to the table in question 10.13 and record the percent range given under the heading entitled "Number of Components in Service by Weight Percent of Listed Substance" (e.g., <5%, 5-10%, 11-25%, etc.)

²The EPA assigns a control efficiency of 100 percent for equipment leaks controlled with rupture discs under normal operating conditions. The EPA assigns a control efficiency of 98 percent for emissions routed to a flare under normal operating conditions

☐ Mark (X) this box if you attach a continuation sheet.

☐ Mark (X) this box if you attach a continuation sheet.

- 10.16 Raw Material, Intermediate and Product Storage Emissions - - Complete the following table by providing the information on each liquid raw material, intermediate, and product storage vessel containing the listed substance as identified in your process block or residual treatment block flow diagram(s).

CBI

☐

Vessel Type ¹	Floating Roof ² Seals	Composition of Stored Materials ³	Throughput (liters per year)	Vessel Filling Rate (gpm)	Vessel Filling Duration (min)	Vessel Inner Diameter (m)	Vessel Height (m)	Operating Volume (l)	Vessel Emission Controls ⁴	Design Flow Rate ⁵	Vent Diameter (cm)	Control Efficiency (%)	Basis for Estimate ⁶
P (20PSI)	NA	26-75	UK	93	129	4	4	45,420	closed system	NA	NA	NA	NA

¹Use the following codes to designate vessel type:

F = Fixed roof
 CIF = Contact internal floating roof
 NCIF = Noncontact internal floating roof
 EFR = External floating roof
 P = Pressure vessel (indicate pressure rating)
 H = Horizontal
 U = Underground

²Use the following codes to designate floating roof seals:

MS1 = Mechanical shoe, primary
 MS2 = Shoe-mounted secondary
 MS2R = Rim-mounted, secondary
 LM1 = Liquid-mounted resilient filled seal, primary
 LM2 = Rim-mounted shield
 LMW = Weather shield
 VM1 = Vapor mounted resilient filled seal, primary
 VM2 = Rim-mounted secondary
 VMW = Weather shield

³Indicate weight percent of the listed substance. Include the total volatile organic content in parenthesis

⁴Other than floating roofs

⁵Gas/vapor flow rate the emission control device was designed to handle (specify flow rate units)

⁶Use the following codes to designate basis for estimate of control efficiency:

C = Calculations
 S = Sampling

APPENDIX I: List of Continuation Sheets

Attach continuation sheets for sections of this form and optional information after this page. In column 1, clearly identify the continuation sheet by listing the question number to which it relates. In column 2, enter the inclusive page numbers of the continuation sheet for each question number.

[illegible]

☐ Mark (X) this box if you attach a continuation sheet.

MATERIAL SAFETY DATA SHEET

Mobay Corporation
A Bayer USA INC. COMPANY

DIVISION ADDRESS

Bayer



MOBAY CORPORATION
Polyurethane Division
Mobay Road
Pittsburgh, PA 15205-9741

ISSUE DATE
SUPERSEDES

12/19/88

TRANSPORTATION EMERGENCY: CALL CHEMTREC
TELEPHONE NO: 800-424-9300; DISTRICT OF COLUMBIA: 202-483-7616

MOBAY NON-TRANSPORTATION EMERGENCY NO.:
(412) 923-1800

I. PRODUCT IDENTIFICATION

PRODUCT NAME.....: Baytherm 933 Component A
PRODUCT CODE NUMBER.....: U-933-A
CHEMICAL FAMILY.....: Aromatic Isocyanate Prepolymer
CHEMICAL NAME.....: Toluene Diisocyanate (TDI) Polyether Prepolymer
SYNONYMS.....: Modified Toluene Diisocyanate (TDI) Polyether Prepolymer
CAS NUMBER.....: 59154-64-2
T.S.C.A. STATUS.....: This product is listed on the TSCA Inventory.
OSHA HAZARD COMMUNICATION STATUS.....: This product is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.
CHEMICAL FORMULA.....: Not Applicable

II. HAZARDOUS INGREDIENTS

COMPONENTS:	%:	OSHA-PEL	ACGIH-TLV
Toluene Diisocyanate (TDI) (CAS# 26471-62-5)	65-75	0.02 ppm Ceiling	0.005 ppm TWA 0.02 ppm STEL

III. PHYSICAL DATA

APPEARANCE.....: Liquid
COLOR.....: Water White to Pale Yellow
ODOR.....: Sharp, Pungent
ODOR THRESHOLD.....: Greater than TLV of 0.005 ppm
MOLECULAR WEIGHT.....: Not Established
MELT POINT/FREEZE POINT....: Approx. 55°F (13°C) for TDI
BOILING POINT.....: Approx. 484°F (251°C) for TDI
VAPOR PRESSURE.....: Approx. 0.025 mm Hg @ 77°F (25°C) for TDI
VAPOR DENSITY (AIR=1).....: 6.0 for TDI
pH.....: Not Applicable
SPECIFIC GRAVITY.....: 1.22 @ 77°F (25°C)
BULK DENSITY.....: 10.18 lbs/gal.
SOLUBILITY IN WATER.....: Not soluble. Reacts slowly with water at normal room temperature to liberate CO₂ gas.
% VOLATILE BY VOLUME.....: Negligible

Product Code: U-933-A
Page 1 of 8

IV. FIRE & EXPLOSION DATA

FLASH POINT °F(°C).....: 265°F (129°C) Pensky-Martens Closed Cup

FLAMMABLE LIMITS -

Le1.....: 0.9% for TDI

Ue1.....: 9.5% for TDI

EXTINGUISHING MEDIA.....: Dry chemical (e.g. monoammonium phosphate, potassium sulfate, and potassium chloride), carbon dioxide, high expansion (proteinic) chemical foam, water spray for large fires. Caution: Reaction between water or foam and hot TDI can be vigorous.

SPECIAL FIRE FIGHTING PROCEDURES/UNUSUAL FIRE OR EXPLOSION HAZARDS:

Full emergency equipment with self-contained breathing apparatus and full protective clothing (such as rubber gloves, boots, bands around legs, arms and waist) should be worn by fire fighters. No skin surface should be exposed. During a fire, TDI vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion. (See Section VIII). At temperatures greater than 350°F (177°C) TDI forms carbodiimides with the release of CO₂, which can cause pressure build-up in closed containers. Explosive rupture is possible. Therefore, use cold water to cool fire-exposed containers.

V. HUMAN HEALTH DATA

PRIMARY ROUTE(S) OF

ENTRY.....: Inhalation. Skin Contact from liquid, vapors or aerosols.

EFFECTS AND SYMPTOMS OF OVEREXPOSURE - Data has not been established for this product. The data listed is for TDI.

INHALATION

Acute Exposure. TDI vapors or mist at concentrations above the TLV can irritate (burning sensation) the mucous membranes in the respiratory tract (nose, throat, lungs) causing runny nose, sore throat, coughing, chest discomfort, shortness of breath and reduced lung function (breathing obstruction). Persons with a preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the TLV with similar symptoms as well as asthma attack. Exposure well above the TLV may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). These effects are usually reversible. Chemical or hypersensitive pneumonitis, with flu-like symptoms (e.g., fever, chills), has also been reported. These symptoms can be delayed up to several hours after exposure.

Chronic Exposure. As a result of previous repeated overexposures or a single large dose, certain individuals may develop isocyanate sensitization (chemical asthma) which will cause them to react to a later exposure to isocyanate at levels well below the TLV. These symptoms, which can include chest tightness, wheezing, cough, shortness of breath or asthmatic attack, could be immediate or delayed up to several hours after exposure. Similar to many non-specific asthmatic responses, there are reports that once sensitized an individual can experience these symptoms upon exposure to dust, cold air or other irritants. This increased lung sensitivity can persist for weeks and in severe cases for several years. Chronic overexposure to isocyanate has also been reported to cause lung damage (including decrease in lung function) which may be permanent. Sensitization can either be temporary or permanent.

V. HUMAN HEALTH DATA (Continued)

SKIN CONTACT

Acute Exposure. Isocyanates react with skin protein and moisture and can cause irritation which may include the following symptoms: reddening, swelling, rash, scaling or blistering. Cured material is difficult to remove.

Chronic Exposure. Prolonged contact can cause reddening, swelling, rash, scaling, blistering, and, in some cases, skin sensitization. Individuals who have developed a skin sensitization can develop these symptoms as a result of contact with very small amounts of liquid material or as a result of exposure to vapor.

EYE CONTACT

Acute Exposure. Liquid, aerosols or vapors are severely irritating and can cause pain, tearing, reddening and swelling. If left untreated, corneal damage can occur and injury is slow to heal. However, damage is usually reversible. See Section VI for treatment.

Chronic Exposure. Prolonged vapor contact may cause conjunctivitis.

INGESTION

Acute Exposure. Can result in irritation and corrosive action in the mouth, stomach tissue and digestive tract. Symptoms can include sore throat, abdominal pain, nausea, vomiting and diarrhea.

Chronic Exposure. None found.

MEDICAL CONDITIONS

AGGRAVATED BY EXPOSURE... Asthma, other respiratory disorders (bronchitis, emphysema, bronchial hyperreactivity), skin allergies, eczema.

CARCINOGENICITY..... No carcinogenic activity was observed in lifetime inhalation studies in rats and mice (International Isocyanate Institute).

NTP..... The National Toxicology Program reported that TDI caused an increase in the number of tumors in exposed rats over those counted in non-exposed rats. The TDI was administered in corn-oil and introduced into the stomach through a tube. Based on this study, the NTP has listed TDI as a substance that may reasonably be anticipated to be a carcinogen in its Fourth Annual Report on Carcinogens.

IARC..... IARC has announced that it will list TDI as a substance for which there is sufficient evidence for its carcinogenicity in experimental animals but inadequate evidence for the carcinogenicity of TDI to humans (IARC Monograph 39).

OSHA..... Not listed.

EXPOSURE LIMITS..... Exposure limits have not been established for this product. Use the exposure limits listed below and in Section II of the MSDS for TDI.

OSHA PEL..... 0.02 ppm Ceiling (TDI)

ACGIH TLV..... 0.005 ppm TWA/0.02 ppm STEL (TDI)

VI. EMERGENCY & FIRST AID PROCEDURES

EYE CONTACT.....: Flush with copious amounts of water, preferably lukewarm for at least 15 minutes holding eyelids open all the time. Refer individual to physician or an ophthalmologist for immediate follow-up.

SKIN CONTACT.....: Remove contaminated clothing immediately. Wash affected areas thoroughly with soap and water for at least 15 minutes. Tincture of green soap and water is also effective in removing isocyanates. Wash contaminated clothing thoroughly before reuse. For severe exposures, get under safety shower after removing clothing, then get medical attention. For lesser exposures, seek medical attention if irritation develops or persists after the area is washed.

INHALATION.....: Move to an area free from risk of further exposure. Administer oxygen or artificial respiration as needed. Obtain medical attention. Asthmatic-type symptoms may develop and may be immediate or delayed up to several hours. Consult physician.

INGESTION.....: Do not induce vomiting. Give 1 to 2 cups of milk or water to drink. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. Consult physician.

NOTE TO PHYSICIAN.....: Eyes. Stain for evidence of corneal injury. If cornea is burned, instill antibiotic steroid preparation frequently. Workplace vapors have produced reversible corneal epithelial edema impairing vision. Skin. This compound is a known skin sensitizer. Treat symptomatically as for contact dermatitis or thermal burns. Ingestion. Treat symptomatically. There is no specific antidote. Inducing vomiting is contraindicated because of the irritating nature of this compound.

Respiratory. This compound is a known pulmonary sensitizer. Treatment is essentially symptomatic. An individual having a skin or pulmonary sensitization reaction to this material should be removed from exposure to any isocyanate.

VII. EMPLOYEE PROTECTION RECOMMENDATIONS

EYE PROTECTION.....: Liquid chemical goggles or full-face shield. Contact lenses should not be worn. If vapor exposure is causing irritation, use a full-face, air-supplied respirator.

SKIN PROTECTION.....: Chemical resistant gloves (butyl rubber, nitrile rubber, polyvinyl alcohol). However, please note that PVA degrades in water. Cover as much of the exposed skin area as possible with appropriate clothing. If skin creams are used, keep the area covered only by the cream to a minimum.

RESPIRATORY PROTECTION....: An approved positive pressure air-supplied respirator is required whenever TDI concentrations are not known or exceed the Short-Term Exposure or Ceiling Limit of 0.02 ppm or exceed the 8-hour Time Weighted Average TLV of 0.005 ppm. An approved air-supplied respirator with full facepiece must also be worn during spray application, even if exhaust ventilation is used. For emergency and other conditions where the exposure limits may be greatly exceeded, use an approved, positive pressure self-contained breathing apparatus. TDI has poor warning properties since the odor at which TDI can be smelled is substantially higher than 0.02 ppm. Observe OSHA regulations for respirator use (29 CFR 1910.134).

VII. EMPLOYEE PROTECTION RECOMMENDATIONS (Continued)

VENTILATION.....: Local exhaust should be used to maintain levels below the TLV whenever TDI is handled, processed, or spray-applied. At normal room temperatures (70°F) TDI levels quickly exceed the TLV unless properly ventilated. Standard reference sources regarding industrial ventilation (e.g., ACGIH Industrial Ventilation) should be consulted for guidance about adequate ventilation.

MONITORING.....: TDI exposure levels must be monitored by accepted monitoring techniques to ensure that the TLV is not exceeded. (Contact Mobay for guidance). See Volume 1 (Chapter 17) and Volume 3 (Chapter 3) in Patty's Industrial Hygiene and Toxicology for sampling strategy.

MEDICAL SURVEILLANCE.....: Medical supervision of all employees who handle or come in contact with TDI is recommended. These should include preemployment and periodic medical examinations with respiratory function tests (FEV, FVC as a minimum). Persons with asthmatic-type conditions, chronic bronchitis, other chronic respiratory diseases or recurrent skin eczema or sensitization should be excluded from working with TDI. Once a person is diagnosed as sensitized to TDI, no further exposure can be permitted.

OTHER.....: Safety showers and eyewash stations should be available. Educate and train employees in safe use of product. Follow all label instructions.

VIII. REACTIVITY DATA

STABILITY.....: Stable under normal conditions.

POLYMERIZATION.....: May occur if in contact with moisture or other materials which react with isocyanates. Self-reaction may occur at temperatures over 350°F (177°C) or at lower temperatures if sufficient time is involved. See Section IV.

INCOMPATIBILITY

(MATERIALS TO AVOID).....: Water, amines, strong bases, alcohols. Will cause some corrosion to copper alloys and aluminum. Reacts with water to form heat, CO₂ and insoluble ureas.

HAZARDOUS DECOMPOSITION

PRODUCTS.....: By high heat and fire: carbon monoxide, oxides of nitrogen, traces of HCN, TDI vapors and mist.

IX. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Evacuate and ventilate spill area; dike spill to prevent entry into water system; wear full protective equipment, including respiratory equipment during clean-up. (See Section VII).

Major Spill: Call Mobay at 412/923-1800. If transportation spill, call CHEMTREC 800/424-9300. If temporary control of isocyanate vapor is required, a blanket of protein foam (available at most fire departments) may be placed over the spill. Large quantities may be pumped into closed, but not sealed, container for disposal.

Minor Spill: Absorb isocyanate with sawdust or other absorbent, shovel into suitable unsealed containers, transport to well-ventilated area (outside) and treat with neutralizing solution: mixture of water (80%) with non-ionic

Product Code: U-933-A

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IX. SPILL OR LEAK PROCEDURES (Continued)

surfactant Tergitol TMN-10 (20%), or; water (90%), concentrated ammonia (3-8%) and detergent (2%). Add about 10 parts of neutralizer per part of isocyanate, with mixing. Allow to stand uncovered for 48 hours to let CO₂ escape.

Clean-up: Decontaminate floor with decontamination solution letting stand for at least 15 minutes.

CERCLA (SUPERFUND) REPORTABLE QUANTITY: 100 pounds for TDI

WASTE DISPOSAL METHOD.....: Follow all federal, state or local regulations. TDI must be disposed of in a permitted incinerator or landfill. Incineration is the preferred method for liquids. Solids are usually incinerated or landfilled. Empty containers must be handled with care due to product residue. Decontaminate containers prior to disposal. Empty decontaminated containers should be crushed to prevent reuse. **DO NOT HEAT OR CUT EMPTY CONTAINER WITH ELECTRIC OR GAS TORCH.** (See Sections IV and VIII). Vapors and gases may be highly toxic.

RCRA STATUS.....: TDI is listed as a hazardous waste (No. U-223) under Title 40 Code of Federal Regulations, Section 261.33 (f). The residue from decontaminating a TDI spill is also classified as a hazardous waste under Section 261.3 (c)(2) or RCRA.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA), TITLE III:

Section 302 - Extremely Hazardous Substances:

2,4-Toluene Diisocyanate (TDI) (CAS# 584-84-9) = 52-68%

2,6-Toluene Diisocyanate (TDI) (CAS# 91-08-7) = 13-17%

Section 313 - Toxic Chemicals:

2,4-Toluene Diisocyanate (TDI) (CAS# 584-84-9) = 52-68%

2,6-Toluene Diisocyanate (TDI) (CAS# 91-08-7) = 13-17%

X. SPECIAL PRECAUTIONS & STORAGE DATA

STORAGE TEMPERATURE

(MIN./MAX.).....: 65°F (18°C)/120°F (49°C)

AVERAGE SHELF LIFE.....: 6 months

SPECIAL SENSITIVITY

(HEAT, LIGHT, MOISTURE): If container is exposed to high heat, 375°F (177°C) it can be pressurized and possibly rupture. TDI reacts slowly with water to form polyureas and liberates CO₂ gas. This gas can cause sealed containers to expand and possibly rupture.

PRECAUTIONS TO BE TAKEN

IN HANDLING AND STORING.: Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected. Prevent all contact. Do not breathe the vapors. Warning properties (irritation of the eyes, nose and throat or odor) are not adequate to prevent chronic overexposure from inhalation. This material can produce asthmatic sensitization upon either single inhalation exposure to a relatively high concentration or upon repeated inhalation exposures to lower concentrations. Exposure to vapors of heated TDI can be extremely dangerous. Employee education and training in safe handling of this product are required under the OSHA Hazard Communication Standard.

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XI. SHIPPING DATA

D.O.T. SHIPPING NAME.....: Poisonous Liquid, NOS
TECHNICAL SHIPPING NAME....: Modified Toluene Diisocyanate Prepolymer
D.O.T. HAZARD CLASS.....: Poison B
UN/NA NO.....: UN 2810
PRODUCT RQ.....: 133 pounds
D.O.T. LABELS.....: Poison
D.O.T. PLACARDS.....: Poison
FRT. CLASS BULK.....: Chemicals, NOI (Toluene Diisocyanate)
FRT. CLASS PKG.....: Chemicals, NOI (Toluene Diisocyanate), NMFC 60000
PRODUCT LABEL.....: Baytherm 933 Component A Product Label

XII. ANIMAL TOXICITY DATA

ACUTE TOXICITY - Data has not been established for this product. Data listed is for TDI.

ORAL, LD50.....: Range of 4130-6170 mg/kg (Rats and Mice)
DERMAL, LD50.....: Greater than 10,000 mg/kg (Rabbits)
INHALATION, LC50.(4 hr): Range of 16-50 ppm (Rat), 10 ppm (Mouse),
11 ppm (Rabbit), 13 ppm (Guinea Pig).
EYE EFFECTS.....: Severe eye irritant capable of inducing corneal opacity.

SKIN EFFECTS.....: Moderate skin irritant. Primary dermal irritation score: 4.12/8.0 (Draize). However, repeated or prolonged contact may culminate in severe skin irritation and/or corrosion.

SENSITIZATION.....: Skin sensitizer in guinea pigs. One study using guinea pigs reported that repeated skin contact with TDI caused respiratory sensitization. Although poorly defined in experimental animal models, TDI is known to be a pulmonary sensitizer in humans. In addition, there is some evidence that cross-sensitization between different types of diisocyanates may occur.

SUB-CHRONIC/CHRONIC TOXICITY: Sub-chronic and chronic animal studies show that the primary effects of inhaling vapors and/or aerosols of TDI are restricted to the pulmonary systems. Emphysema, pulmonary edema, pneumonitis and rhinitis are common pathologic effects. Extended exposures to as low as 0.1 ppm TDI have induces pulmonary inflammation.

OTHER

CARCINOGENICITY.....: The NTP conducted carcinogenesis studies of a commercial grade TDI using rats and mice in which the test material was diluted in corn oil and administered by gavage. The investigators concluded that TDI was carcinogenic in male and female rats (fibrosarcomas, pancreatic adenomas, neoplastic liver nodules and mammary gland fibrosarcomas) and female mice (hemangiosarcomas and hepatocellular adenomas). However, chronic inhalation studies in which rats and mice were exposed to 0.05 and 0.15 ppm TDI (10-30 times recommended TLV, 8-hr level) induced no treatment-related tumorigenic effects. In these studies, both exposure levels produced extensive irritation to the nasal passages and upper respiratory system of the test animals indicating that suitable effective exposures were administered.

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XII. ANIMAL TOXICITY DATA (Continued)

MUTAGENICITY.....: TDI is positive in the Ames assay with activation. However, mammalian cell transformation assays using human lung cells and Syrian hamster kidney cells were negative, as were micronucleus tests using rats and mice.

AQUATIC TOXICITY.....: LC₅₀ - 96 hr (static): 165 mg/liter (Fathead minnow)
LC₅₀ - 96 hr (static): Greater than 508 mg/liter (Grass shrimp)
LC₅₀ - 24 hr (static): Greater than 500 mg/liter (Daphnia magna)

XIII. APPROVALS

REASON FOR ISSUE.....: New Product
PREPARED BY.....: G. L. Copeland
APPROVED BY.....: J. H. Chapman
TITLE.....: Manager, Product Safety - Polyurethane & Coatings

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MATERIAL SAFETY DATA SHEET

DOW CHEMICAL U.S.A.

MIDLAND, MICHIGAN 48674

EMERGENCY (517) • 636 • 4400

Product Code: 92067

Page: 1

PRODUCT NAME: VORANATE (R) 3138 SPECIALTY ISOCYANATE

Effective Date: 03/20/88 Date Printed: 07/19/88

MSDS:001048

1. INGREDIENTS:

Modified crude toluene diisocyanate containing
<1% of a silicone surfactant and greater
than 50% free TDI

CAS# 026471-62-5

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

2. PHYSICAL DATA:

BOILING POINT: 518F, 270C
VAP PRESS: 0.02 mmHg @ 20C
VAP DENSITY: 6.94
SOL. IN WATER: Reacts
SP. GRAVITY: 1.25 +0/- .02 (25C/25C)
APPEARANCE: Clear brown liquid
ODOR: Sharp pungent odor.

3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: 262F, 128C
METHOD USED: PMCC, ASTM D-93

FLAMMABLE LIMITS

LFL: Not determined
UFL: Not determined

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, foam, halon 1211. If water is used, it should be in very large quantity. The reaction between water and hot isocyanate may be vigorous.

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3. FIRE AND EXPLOSION HAZARD DATA: (CONTINUED)

FIRE & EXPLOSION HAZARDS: Down-wind personnel must be evacuated. Do not reseal contaminated containers since pressure build-up may cause rupture.

FIRE-FIGHTING EQUIPMENT: People who are fighting isocyanate fires must be protected against nitrogen oxide fumes and isocyanate vapors by wearing positive pressure self-contained breathing apparatus and full protective clothing.

4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID) Stable when stored under recommended storage conditions. Store in a dry place at temperatures between 18-41C (65-105F).

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Water, acid, base, alcohols, metal compounds, surface active materials. Avoid water as it reacts to form heat, CO₂ and insoluble urea. The combined effect of the CO₂ and heat can produce enough pressure to rupture a closed container.

HAZARDOUS DECOMPOSITION PRODUCTS: Isocyanate vapor and mist, carbon dioxide, carbon monoxide, nitrogen oxides and traces of hydrogen cyanide.

HAZARDOUS POLYMERIZATION: May occur with incompatible reactants, especially strong bases, water or temperatures over 41C (105F).

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5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS/LEAKS: Evacuate and ventilate spill area, dike spill to prevent entry into water system, wear full protective equipment including respiratory equipment during clean up.

Major spill: Call Dow Chemical U.S.A. (409) 238-2112. If transportation spill involved call CHEMTREC (800) 424-9300. If temporary control of isocyanate vapor is required a blanket of protein foam (available at most fire departments) may be placed over the spill. Large quantities may be pumped into closed but not sealed quantities for disposal.

Minor spill: Absorb the isocyanate with sawdust or other absorbent, shovel into suitable unsealed containers, transport to well-ventilated area (outside) and treat with neutralizing solution consisting of a mixture of water and 3-8% concentrated ammonium hydroxide (or 5-10% sodium carbonate). Add about 10 parts of neutralizer per part of isocyanate with mixing. Allow to stand for 48 hours letting evolved CO₂ escape.

Clean-up: Decontaminate floor using water/ammonia solution with 1-2% added detergent letting stand over affected area for at least 10 minutes. Cover mops and brooms used for this with plastic and dispose properly (often by incineration).

DISPOSAL METHOD: Follow all federal, state and local regulations. Liquids are usually incinerated in a proper facility. Solids are usually also incinerated or landfilled. Empty drums should be filled with water; let stand for at least 48 hours; drums should be drained, triple rinsed, and holed or crushed to prevent reuse. Dispose of drain and rinse fluid according to local, state, and federal regulations.

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6. HEALTH HAZARD DATA:

EYE: May cause pain, moderate eye irritation and moderate corneal injury. Effects may be slow to heal. (In animals, all washed eyes healed within 11 days.)

SKIN CONTACT: Prolonged or repeated exposure may cause severe irritation, even a burn. Skin contact may result in allergic sensitization even though it is not expected to result in absorption of amounts sufficient to cause other adverse effects.

SKIN ABSORPTION: The LD50 for skin absorption in rabbits is >5000 mg/kg.

INGESTION: Single dose oral toxicity is low. The oral LD50 for rats is >10,000 mg/kg. Ingestion may cause gastrointestinal irritation or ulceration.

INHALATION: Excessive vapor concentrations are attainable and could be hazardous on single exposure. Single and repeated excessive exposure may cause severe irritation to upper respiratory tract and lungs (choking sensation, chest tightness), respiratory sensitization, decreased ventilatory capacity, liver effects, cholinesterase depression, gastrointestinal distress and/or neurologic disorders. The 4-hour LC50 for TDI for rats is 13.9 ppm.

SYSTEMIC & OTHER EFFECTS: Based on available data, repeated exposures are not anticipated to cause any additional significant adverse effects. This mixture contains a component which is listed as a potential carcinogen for hazard communication purposes under OSHA standard 29 CFR 1910.1200. (TDI, listed by Nat'l Tox Program and IARC). An oral study in which high doses of TDI were reported to cause cancer in animals has been found to contain numerous deficiencies which compromise the validity of the study. TDI did not cause cancer in laboratory animals exposed by inhalation, the most likely route of exposure.

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6. HEALTH HAZARD DATA: (CONTINUED)

Results of in vitro ("test tube") mutagenicity tests have been inconclusive.

7. FIRST AID:

EYES: Irrigate with flowing water immediately and continuously for 15 minutes. Consult medical personnel.

SKIN: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician if irritation persists. Wash clothing before reuse. Destroy contaminated shoes.

INGESTION: Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.

INHALATION: Remove to fresh air. If not breathing, give mouth-to-mouth resuscitation. If breathing is difficult, give oxygen. Call a physician.

NOTE TO PHYSICIAN: Corrosive. May cause stricture. If lavage is performed, suggest endotracheal and/or esophagoscopy control. If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient. The manifestations of the respiratory symptoms, including pulmonary edema, resulting from acute exposure may be delayed. May cause respiratory sensitization. Cholinesterase inhibition has been noted in human exposure but is not of benefit in determining exposure and is not correlated with signs of exposure.

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8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE(S): OSHA PEL is 0.02 ppm as a ceiling limit for toluene 2,4-diisocyanate. ACGIH TLV is 0.005 ppm; 0.02 ppm STEL for toluene 2,4-diisocyanate. Dow Industrial Hygiene Guide is 0.02 ppm as a ceiling limit for toluene diisocyanate.

VENTILATION: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use an approved supplied-air respirator. For emergency and other conditions where the exposure guideline may be greatly exceeded, use an approved positive-pressure self-contained breathing apparatus.

SKIN PROTECTION: Use protective clothing impervious to this material. Selection of specific items such as gloves, boots, apron, or full-body suit will depend on operation. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse. Safety shower should be located in immediate work area.

EYE PROTECTION: Use chemical goggles. If vapor exposure causes eye irritation, use a full-face, supplied-air respirator. Eye wash fountain should be located in immediate work area.

9. ADDITIONAL INFORMATION:

REGULATORY REQUIREMENTS:

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is

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9. ADDITIONAL INFORMATION: (CONTINUED)

considered, under applicable definitions, to meet the following categories:

- An immediate health hazard
- A delayed health hazard
- A reactive hazard

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Prevent all contact; warning properties of this material (irritation of eyes, nose, and throat) are not adequate to prevent chronic overexposure from inhalation. This material can produce asthmatic sensitization upon either single inhalation exposure to a relatively high concentration or upon repeated inhalation exposure to lower concentrations. Exposures to vapors of heated TDI can be extremely dangerous.

MSDS STATUS: Revised Section 9.

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